# CHEMICAL INDUSTRIES

. . the business magazine for makers and users of chemicals

Management • Research • Production • Marketing

Volume 45 Number 4


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## *Don't Miss Them!*

Just as we go to press we have received definite acceptances of our invitations to write for our two Silver Anniversary issues from W. J. Austin, president of The Austin Company and from R. L. Murray, director of development of Hooker Electrochemical Company. Between them they will discuss "Modernization of Chemical Plants"—from both the building and equipment angles.

And also an acceptance from Dr. L. W. Bass, assistant director, Mellon Institute of Industrial Research, who will present some very interesting thoughts on "Pure Research and its Relationship to Industry."

The whole chemical industry is impatiently waiting to hear about Columbia Alkali's new caustic soda developments. The complete story will appear in December.

And so once again we suggest that you do not fail to read our two Silver Anniversary Issues—November devoted to:

Practical Plant Operations, Maintenance and Administration.

December: New Chemicals for Industry.


### Consulting Editors

R. T. Baldwin, L. W. Bass, F. M. Becket, B. T. Brooks, J. V. N. Dorr, C. R. Downs, W. M. Grosvenor, W. S. Landis, and M. C. Whitaker.

### Publication Staff

Williams Haynes, Editorial Director; Walter J. Murphy, Managing Editor; W. F. George, Advertising Manager; L. Chas. Todaro, Circulation Manager; John H. Burt, Production Manager.



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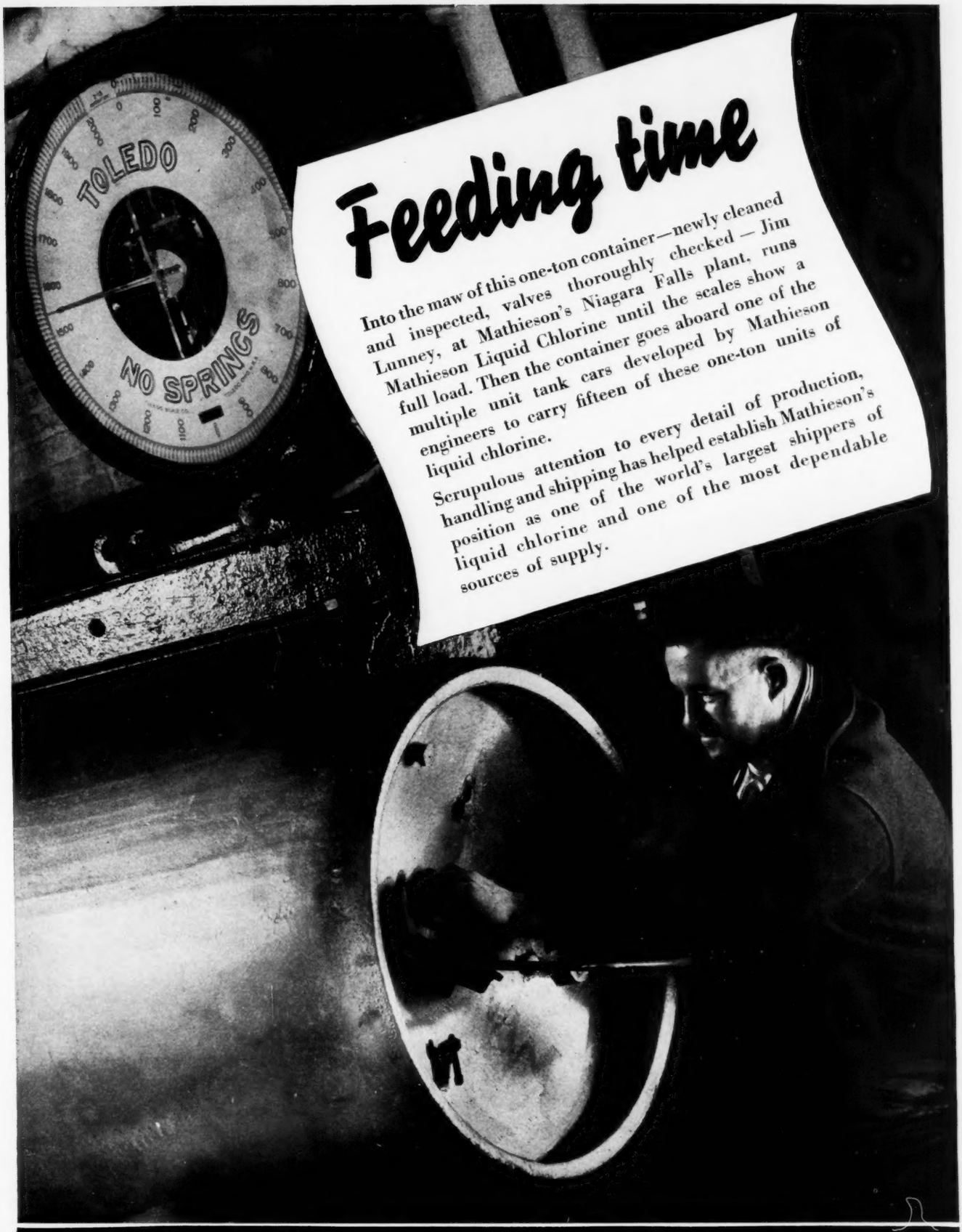



# Feeding time

Into the maw of this one-ton container—newly cleaned and inspected, valves thoroughly checked — Jim Lunney, at Mathieson's Niagara Falls plant, runs Mathieson Liquid Chlorine until the scales show a full load. Then the container goes aboard one of the multiple unit tank cars developed by Mathieson engineers to carry fifteen of these one-ton units of liquid chlorine.

Scrupulous attention to every detail of production, handling and shipping has helped establish Mathieson's position as one of the world's largest shippers of liquid chlorine and one of the most dependable sources of supply.

**Mathieson Chemicals**

THE MATHIESON ALKALI WORKS (INC.)
60 E. 42ND STREET, NEW YORK, N. Y.

SODA ASH . . . CAUSTIC SODA . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . HTH PRODUCTS . . . AMMONIA, ANHYDROUS and AQUA . . . FUSED ALKALI PRODUCTS . . . CCH (INDUSTRIAL HYPOCHLORITE) . . . DRY ICE . . . CARBONIC GAS . . . ANALYTICAL SODIUM CHLORITE

# The Reader Writes:—

## TNEC Proposals

I would like to comment on the News Review relative to the TNEC Preliminary Report, summarized on page 185 of the August issue. I believe that the legislation which has already been enacted by Congress, prior to adjournment, and signed by the President, effects changes which are desirable for all concerned. Simplification of the interference practices is a matter which has long been needed, and other provisions, such as the abolition of renewals, are very desirable. The monopoly restrictions which are advocated should be unobjectionable, if limited to practices which "tend substantially to lessen competition or create a monopoly." On the other hand, I am strongly opposed to any provisions which would require the compulsory licensing of patents, since, to my mind, they tend to curtail the benefits given to the patentee, without any corresponding advantage to the public. Such provisions would inevitably curtail the investment made each year by manufacturers and others for support of their research departments, and accordingly would tend to obstruct progress. Further hearings which Senator O'Mahoney has promised will be held will no doubt bring out the disadvantageous aspects of any proposed legislation along the lines of compulsory licensing.

JOHN D. POPE, III,
*Assistant Patent Attorney,*
Monsanto Chemical Co.
St. Louis, Mo.

## Starting Them Young

I believe the students have been well pleased with CHEMICAL INDUSTRIES and have learnt much about the business side of chemistry through its use.

PROF. C. A. BRAUTLECHT,
*Professor of Chemistry and Chemical Engineering,*
University of Maine,
Orono, Me.

## What Causes the Boom?

It will be very fatal if we collectively begin to believe that the present upward surge is all the result of the present European War. The fact of the matter is that domestic business started to climb sharply from mid-May, based on the expanding needs of our own country—not any rush of buying by the present belligerents.

ARTHUR X. DILLON,
Chicago, Ill.

## Even More Information

In the revision of my book, "Chemical Publications," in preparation for a new edition, I have based several parts of the library problems upon the compilations in your Guide, as our chemical store room purchaser informs me it is his best source of information on chemicals. I am interested now only in whether you plan to include the same kind of information in the next issue of this Guide. If there are any changes, I should appreciate knowing what they are before I send my manuscript to the publishers within a month or two.

DR. M. G. MELLON,
*Professor of Analytical Chemistry,*
Purdue University,
Lafayette, Ind.

*Editor's Note: Dr. Mellon will find the 1939-40 edition of the Buyer's Guidebook Number, out October 25, even more complete with several hundred new commercial chemicals added; also a directory of consultants, patent attorneys, etc.*

## CALENDAR OF EVENTS

**Packaging Institute, Inc.**, 1st Annual Meeting, Edgewater Beach Hotel, Chicago, Illinois, Oct. 12-13.

**National Safety Congress & Exposition**, Atlantic City, N. J., Oct. 16-20.

**American Public Health Association**, William Penn Hotel, Pittsburgh, Pa., Oct. 17-20.

**Porcelain Enamel Institute**, 4th Annual Forum, Ohio State University, Columbus, O., Oct. 18-20.

**4th Annual Fall Meeting and Golf Tournament**, Drug, Chemical & Allied Trades Section, N. Y. Board of Trade, Inc., Skytop, Pa., Oct. 20-21.

**National Pest Control Ass'n**, 7th Annual Convention, Hotel Pennsylvania, New York City, Oct. 23-24-25.

**National Paint, Varnish & Lacquer Association**, Annual Convention, Hotel Fairmont, San Francisco, Oct. 31, Nov. 1-2.

**Oil Trades Association of N. Y.**, Annual Banquet, Hotel Waldorf-Astoria, N. Y. City, Nov. 1.

**National Fertilizer Association**, Annual Fall Southern Meeting, Biltmore Hotel, Atlanta, Ga., Nov. 6-8.

**American Petroleum Institute**, 20th Annual Meeting, Stevens Hotel, Chicago, Nov. 13-17.

**American Institute of Chemical Engineers**, semi-annual meeting, Providence, R. I., Nov. 15-17.

**American Society of Mechanical Engineers**, Philadelphia, Pa., Dec. 4-7.

**17th Exposition of Chemical Industries**, Grand Central Palace, N. Y. City, Dec. 4-9.

**A. C. S.**, Eighth National Organic Chemistry Symposium, Division Organic Chemistry, St. Louis, Mo., Dec. 28-30

**10th Annual Packaging Show**, Hotel Astor, N. Y. City, March 26-29, 1940.

**American Ceramic Society**, 42nd Annual Meeting, Royal York Hotel, Toronto, Canada, Apr. 7-12, 1940.

*Local*

**A. C. S.**, N. Y. City Section, Oct. 6.

**A. C. S.**, N. Y. City Section, Nov. 10; Joint Meeting with the Society of Chemical Industry.

## A "Correct Picture"

Your editorial, "Wall Street's Chemical Valuations," in the September issue was specially timely. It is unfortunate that it could not be given more widespread publicity to the lay public, particularly those who have money to invest and whose conception of the chemical industry is, as you say, "a sort of scientific bonanza." You are to be highly commended for your persistent policy of sticking to facts and not coloring the information you give each month on the developments in industrial chemistry.

D. H. SINGER,
Dallas, Tex.

## How About the Evenings?

Can't you arrange more leisure for me to read CHEMICAL INDUSTRIES? It is my greatest problem—the days are not long enough. Your paper goes the rounds, so at least six others see and enjoy it.

A. H. HOOKER, JR.,
Hooker Electrochemical Company.
Tacoma, Wash.

## West Coast Chemically

I was pleased to see that you carried such a lengthy report on the recent Western Chemical Congress. There seems to be in the East the strong belief that the Pacific Coast markets are worthwhile but not sufficient in volume to warrant any chemical plant construction of a major size. We do have need for several plants making basic chemicals and the presence here of such factories would be accumulative in their effect, for they would attract consuming industries to settle where they can obtain raw materials close at hand. I fail, however, to see your editorial contention that labor conditions are any worse on the Pacific Coast than in the East. We have received some bad publicity but by far and large it is just that and nothing more. Now honestly—where have most of the "sit-down" strikes occurred?

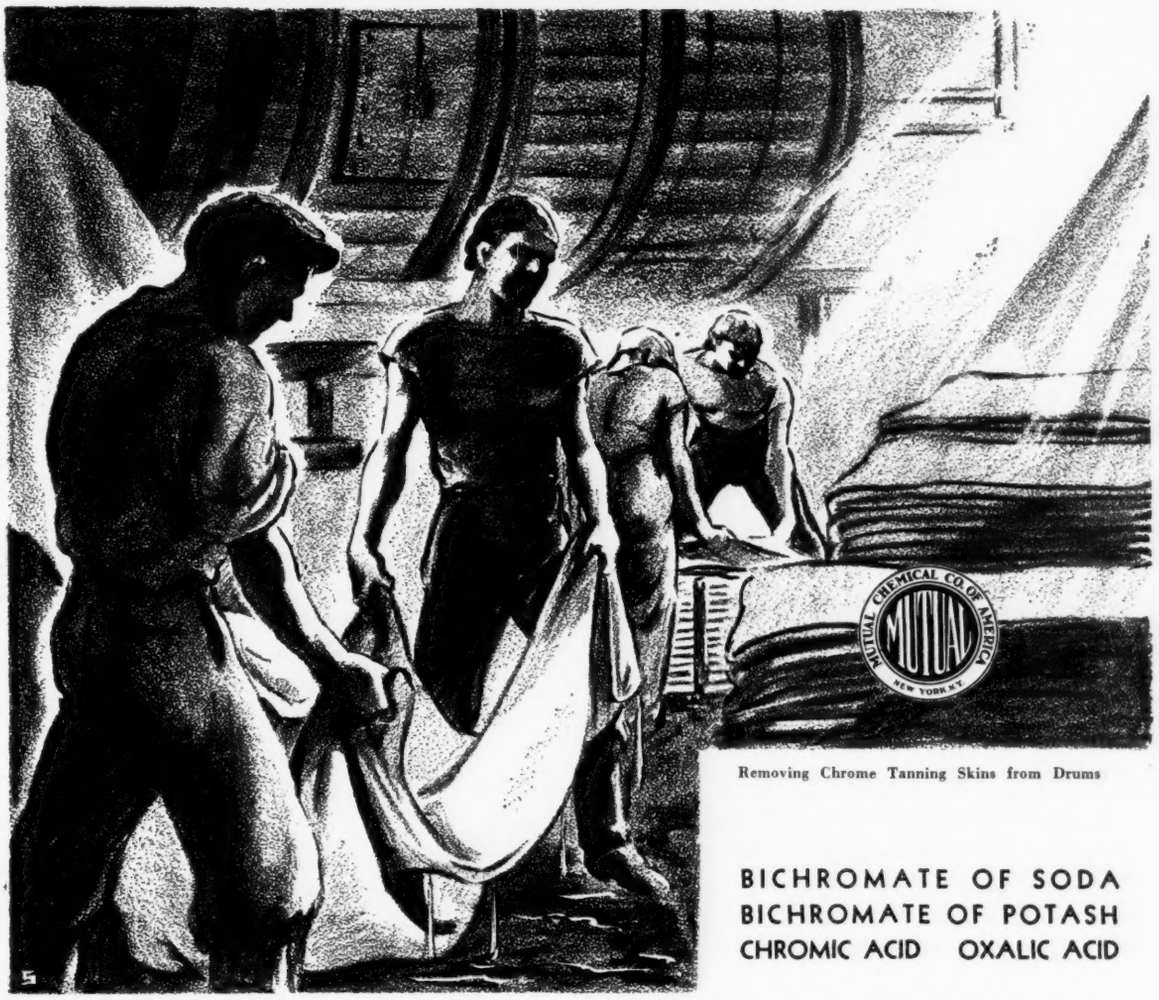
FRANK G. SEIGER.
San Francisco, Calif.

## *We* Thank *You*

We have yours of recent date stating that our Catalogue has been mentioned in your columns. We thank you for this courtesy, and will endeavor to fill requests for copies of this list as we receive them. We might mention that you fellows are certainly on your toes up there.

THOMAS J. GORAND,
Phillips & Jacobs,
Philadelphia, Pa.

# Chromium Chemicals
## FOR THE TANNING INDUSTRY




Removing Chrome Tanning Skins from Drums

BICHROMATE OF SODA
BICHROMATE OF POTASH
CHROMIC ACID OXALIC ACID

**TODAY, leather tanning is the largest single use for Bichromate of Soda. Since the inception of chrome tanning Mutual has supplied leading American tanners with Bichromate of Soda of the highest quality.**

**Operating two processing plants at Jersey City and Baltimore, Mutual offers to chromium users the most complete distribution facilities. Warehouse stocks are maintained in all principal cities including: New York, Jersey City, Newark, Rochester, Syracuse, Philadelphia, Baltimore, Pittsburgh, Charlotte, Detroit, Chicago, Milwaukee, St. Paul, St. Louis, Kansas City, Los Angeles, San Francisco, and throughout New England.**

## Mutual Bichromates

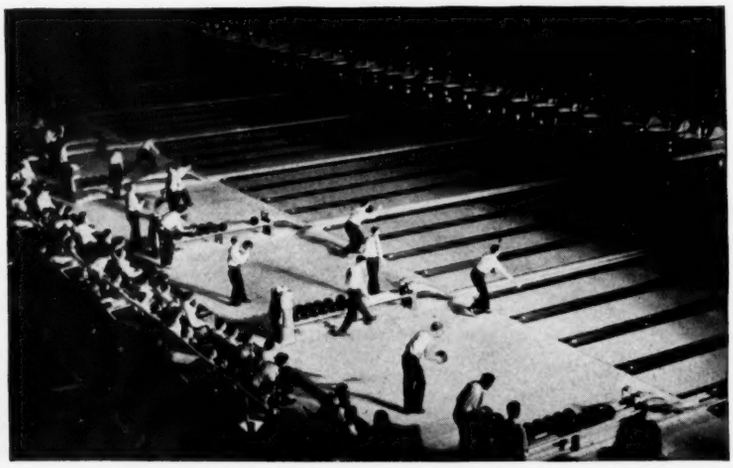
**MUTUAL CHEMICAL COMPANY OF AMERICA . . . . 270 Madison Avenue, New York City**

# LIFE on the

(*Above*) **PHOTOGENIC FOG IS PRODUCED CHEMICALLY** in Hollywood by blowing atomized and perfumed mineral oil into the set with aeroplane propellers. Unlike other substances, it does not cloud camera lenses, nor irritate the actors' throats. The oil is first charged with an aromatic before it is used . . . borrowing an idea from the cosmetic industry. In that field Cyanamid has many customers for sulfonated oils, wetting agents, water soluble gums, zinc stearate, beeswax, talc, magnesium carbonate and magnesium oxide.

(*Above*) **CHEMICALLY TREATED PAPER PROTECTS SOIL** from erosion—in the form of a new mesh paper fabric developed by the makers of Bemis Bags. Called *Erosionet*, it is chemically treated during its twisting process to prevent rotting, and its millions of tiny but tough paper strands act as dams to hold seeds and soil in place, retain moisture, and at the same time admit sunlight. In the paper industry Cyanamid provides products for every step of manufacturing requiring chemicals.

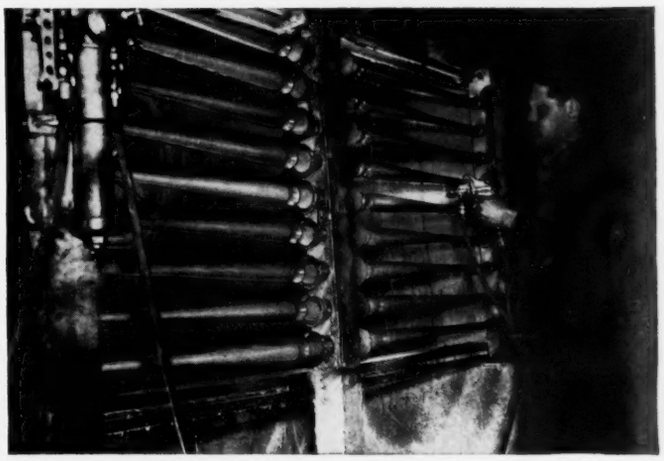
(*Below*) **THE BEST FOOT FORWARD IN LEATHER** usually means the use of Cyanamid products, all of which are constantly being improved in our Stamford Research Laboratories as fast as new scientific knowledge can be applied. For leather men, Cyanamid supplies a complete line of products that reach from the lime to the fatliquor. For quicker tannage, uniform color, better tensile strength, and longer life, the industry looks to Cyanamid for leather chemicals for shoes, upholstery, luggage.

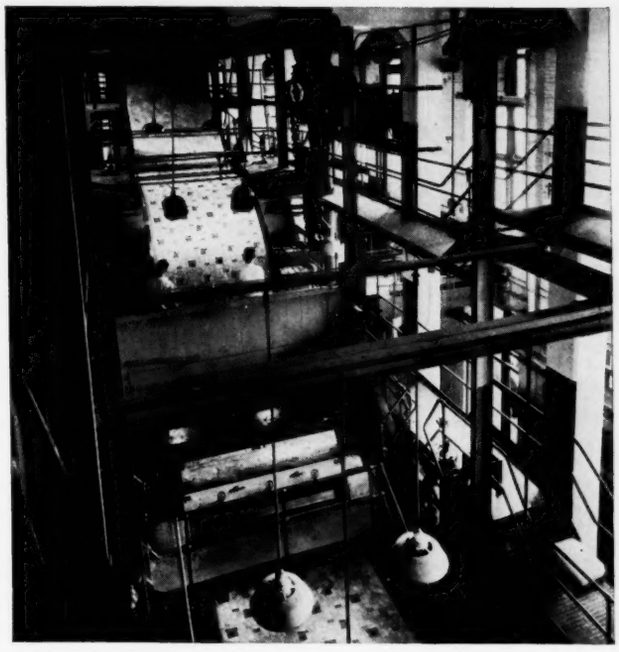


(*Above*) **NEW BOWLING BALL IS TRUE TO .0005".** It is made of combined hard rubber and plastic composition, developed by the Manhattan Rubber Mfg. Co., division of Raybestos-Manhattan, Inc. Perhaps in the next National Bowling Congress, like the Chicago event pictured above, records will be broken because of the accurate manufacturing put into the new ball. Cyanamid supplied products for this development, also, supplies the rubber industry with delayed action activators, accelerators, rubber sulphur, and other chemicals.

# Chemical Newsfront

(*Right*) **A HOME RUN IN MODERN FINISHING** is being given to these baseball bats which may be used in this month's World's Series. Photo shows the spraying operation. Many a glossy, long-wearing finish today has in its composition Cyanamid resins, of which there are many. Favorites in the paint, varnish, and lacquer industries, these products of intensive research have aided considerably in the tremendous strides made by those fields in comparatively recent years. Today's finishes take more punishment and look better than yesteryear's.





(*Above*) **"CHEMICAL FLOOR COVERINGS" ARE MADE ACCURATELY** in the Congoleum-Nairn factory at Kearny, New Jersey. Of linoleum, they are manufactured from oxidized oil and gums mixed with ground cork, wood flour and coloring pigments. Giant revolving cylinders cut out pieces of the composition material, automatically place them against a revolving drum of fabric and the completed pattern is then welded under pressure to the fabric back. There are only three of these giant straight line linoleum inlaying machines in the United States.

(*Above*) **FASTER DRYING PRINTING INKS NOW POSSIBLE** with new formulas are turned out on this typical 3-roll, water-cooled grinding mill. During the last five years tremendous progress has been made in ink manufacturing, for which Cyanamid supplies special resins, high quality solvents and plasticizers like *Aero Brand Dibutyl Phthalate, Ethyl Lactate, **Ketonone E—Ethyl Ortho Benzoyl Benzoate, and many other products.


**American Cyanamid & Chemical Corporation**

30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

*Reg. U. S. Pat. Off. **Trade-mark of American Cyanamid & Chemical Corporation used to denote plasticizers of its manufacture.

ADVERTISING PAGES REMOVED

# Specialties

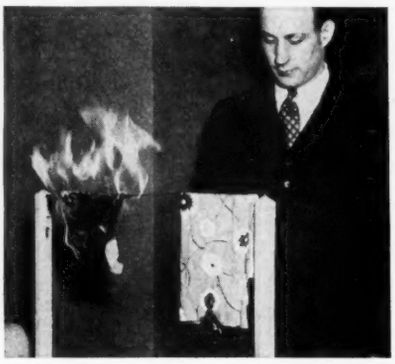
## THAT MAY HELP SOLVE YOUR CHEMICAL PROBLEMS

*The following specialties now available may suggest possibilities for use in your products:*

### FIRE RETARDANTS

**AMMONIUM SULFAMATE:** White crystalline solid, melting point 131° C; extremely soluble in water.

*USES:* For flameproofing textiles and certain grades of paper. Does not impart stiffening action or otherwise adversely affect the "feel" or appearance of treated materials. It is particularly suited for certain special applications.



**FIRE RETARDANT "CM"**—Gives complete protection against spread of flame and afterglow. Recommended for fabrics, paper and specialty products—particularly when freedom from stiffening action and efflorescence is desired.

**FIRE RETARDANT "T"**—Gives complete protection against spread of flame and afterglow. Recommended for use on fabrics and paper in those cases where slight stiffening action and efflorescence are not objectionable.

**FIRE RETARDANT "3 WG"**

This material is recommended for use on fabrics or specialty products which may be subjected to drying at high temperatures. It is free from any tendency to effloresce on the surface of treated materials but imparts a definite stiffening action.

### SULFAMIC ACID:

A strong mineral acid now available in commercial quantities. Non-volatile, non-hygroscopic, crystalline solid. Melting point 205° C, with decomposition. Moderately soluble in water, slightly soluble in organic solvents; all common salts extremely soluble in water.

*USES:* For removal of nitrites following diazotization reactions in the production of azo dyes and lake pigments; leather tanning; cleaning compounds; acidimetric standard in analytical work; intermediate for syntheses

### POTASSIUM SILICATE:

A chemical with several interesting characteristics which may suggest applications in your products.

Weight ratio $SiO_2$:$K_2O$=2.5; molar ratio $SiO_2$:$K_2O$ approx. 3.9; colorless. Available in both glass and solution form.

*USES:* Non-efflorescing base for inorganic paints and protective coatings; flux coating of welding rods; binder in the manufacture of carbon arc light electrodes.

*We invite inquiries for these and other materials which may help solve some of your chemical problems. Technical assistance is available for users of Du Pont chemicals.*

**E. I. DU PONT DE NEMOURS & COMPANY**
INCORPORATED
**GRASSELLI CHEMICALS DEPARTMENT**
WILMINGTON DUPONT REG. U.S. PAT. OFF. DELAWARE

CHEMICAL INDUSTRIES

*The Chemical Business Magazine*

Established 1914

# *War Conditions and Chemicals*

A QUARTER century's progress in the art of war has been demonstrated with a swiftness and clarity that enables us quite quickly to judge with considerable confidence how it will affect our chemical industry. It is futile at this time to guess how long the war will last, or who—even ourselves—may be drawn into it, or what its final political and economic outcomes may be. But it is fortunate that we can gauge pretty accurately the repercussions of armed conflict upon the normal conduct of chemical business. This should enable us to meet war conditions with intelligence and decision. For a great number of very different reasons this industry's handling of its war problems is exceedingly important, not only to ourselves but also to our Government.

On the Eastern and Western Fronts, at sea, and in the air, every bit of military and naval experience confirms the expectation that munitions and machines, not man-power, have become the vital factors. The only surprise of a month's hostilities is that mechanization has gone farther and faster than even the wildest nightmare dreamers expected. War demands for chemicals are plainly much greater and more diversified than in 1914-18. The war pressure upon our chemical markets is greater, but is not fundamentally different than twenty-five years ago.

If, however, demand is little changed, supply has been radically changed. In potash, nitrogen and coal-tar intermediates, famine articles then, we are now, or we can be, wholly independent. Our technique and plant-and-staff capacity have been rounded out so that our chemical production has no gaps such as then existed in solvents, dyes, and medicinals.

Less lauded, but not less important, our chemical industry has learned not only how to make, but also how to sell, a full line of products. Then makers were dependent upon brokers and jobbers. Now they have their own experienced sales staffs. They have even mastered the intricacies of chemical exporting.

Here is a commercial revolution that will affect chemical war conditions in this country quite as much as our technical evolution. No fear of famine of essential chemicals threatens our regular customers. No prospect of dizzy speculation in chemicals by greedy and irresponsible war profiteers plagues either our producers or their regular distributors.

The nervous tremors that rang long distance telephones and kept the telegraph wires humming during the first two weeks of hostilities are quieting. A hundred thousand jittery inquiries from customers about shipments and contracts have been calmly answered. Scores of good stories are told, all revealing our chemical makers in control of the market and determined that that control shall not slip from their hands. Naturally there are price readjustments and obviously these tend upwards. But they have been made only in imported materials or items whose costs have been notoriously out-of-line.

The big, new factors in our chemical war situation are "no famine nor speculation"—for which we may all be devoutly thankful twice over this coming November.

# Editorial

***Controlling War Conditions*** Buyers of chemicals are being urged by manufacturers not to hoard and the advice is excellent. Sufficient supplies of practically every item are available to meet normal requirements even to meet demands caused by rapidly expanding manufacturing activity, provided each and every purchasing agent does his bit. Several progressive chemical producers have publicly stated that they will not increase selling prices, even though there may be an opportunity to do so, unless they are forced to do so. Such a laudable stand on the part of the manufacturers is not pure philanthropy. It is just plain good business sense.

If chemical producers had to fill requests for materials far in excess of what their customers have recently been taking, it would necessitate immediate stepping up of operations and, in some instances, construction of units not otherwise required. Such conditions would compel much higher prices and need not occur if buyers will only heed the homely but sound advice to "keep their shirts on."

Buyers like to effect savings and to have inventories on the right side of the ledger. In the case of natural raw materials there seems to be plenty of justification to acquire at this time sizable stocks. But it is well to remember that large inventories can be "a double-edged sword." About the majority of staple chemicals there is no reason to become "panicky." Indeed, restraint in purchasing now will likely bring about substantial saving by avoiding a quick general rise in the price structure. In the final analysis, higher raw material costs must be passed on to the consumer. If the war should last for even a year the profit derived from heavy purchasing now will not be very great, and if there should be a sudden cessation of hostilities the losses incurred will be a heavy burden on most concerns.

***Control of Prices*** Temporary governmental agencies created for one purpose or another during the past twenty-five years generally have one common characteristic. A large majority of them possess an inordinate desire to perpetuate their existence by reaching out into fields foreign to the ones originally designed.

Not at all surprising, but nevertheless very disconcerting, is the suggestion put forth by Senator O'Mahoney, chairman of the Temporary National Economic Committee, that his group should extend its activities into the field of control of prices. The objectives of the T.N.E.C., as defined by Congress, did not include by any stretch of the imagination any administrative functions. It was brought into being solely as a fact-finding body and American business men were asked to cooperate wholeheartedly strictly on that basis.

Should our price structure show signs of getting completely out of hand as a result of the emergency created by the war in Europe then it is not only likely but desirable that some practical steps be taken to curb speculative activities. This control should be exercised, however, by a body duly authorized by Congress for that purpose. Very definitely the O'Mahoney Committee, campaigning for "new worlds to conquer," should not be permitted to encroach upon Congressional initiative and prerogatives.

If the T.N.E.C. is permitted to set itself up as a public "watchdog" on prices then there will be endless confusion and friction with other permanent governmental agencies, notably the Federal Trade Commission and the Department of Justice. These with the broad powers they now possess should be able to cope with almost any situation that is likely to develop. If not, and a definite need for still another control body becomes self-evident, then Congress, and only Congress, should make the decision as to what is required.

## Quotation Marks

Never again will our industrial production, which depends upon chemistry, be disrupted by wars beyond our shores. Never again will our people be deprived of many vital medicines for the preservation of health. American chemistry is ready—ready for "the world of today and the world of tomorrow."—Lammot du Pont.

# Latin American Chemical Markets

## By Dr. Frederick A. Hessel

***OUTBREAK** of a new European war focuses attention on the strong likelihood that our chemical export business with Central and South America will likely expand at a rapid rate. With Germany unable to continue her lucrative chemical trade in the Western Hemisphere and even England and France seriously handicapped because of the demands of their home industries, a splendid opportunity is now presented to all American chemical manufacturers to expand their export trade relationships. Dr. Frederick A. Hessel, chemical economist, presents important data on the state of chemical trade in Central and South Americas.*

CONSIDERABLE discussion has developed about the possibilities of a sizable increase in exports from this country to Latin America as a consequence of the European war. Much has been said about the great strides we made in trade with our Southern neighbors during and after the last war, and indeed the results of that conflict on Latin American markets are worth remembering.

Our exports to Central and South America have increased fifty per cent. since 1913 and we have supplanted Britain as the leading supplier of imported goods in Latin America. Great Britain's trade has been cut in half and France has become much less important in the South American market during the last twenty-five years. Germany alone, of the great European powers, has increased her exports during that period. And this she has done by a system of Aski, or Barter, marks which has proved so successful that the Reich has been our most formidable rival in trade with Latin America.

Now, however, Germany will be unable to use the Atlantic shipping lanes and there seems to be every reason why American exporters should profit by her loss as well as by the present difficulties that lie in the way of trade between the other belligerent nations and Latin America.

First, however, we must ascertain just where are the best markets for American products and what are the commodities most likely to find a large sale. This we have endeavored to do with regard to the products of the chemical industry which should reap considerable benefits from any increase in trade between this country and Latin America so much of which depends upon imports for its chemical demands.

We are in a very strong position in practically all the countries of both Central and South American groups as may be seen in Table I, showing imports of chemical products into Latin America.

Here we have also evidence of Germany's dangerous competition for we see that the Reich has been

**Table I**
**Imports of Chemical Products into Latin America***

| *Country* | *Year* | *Value in $* | *Principal Countries of Origin* |
|---|---|---|---|
| Argentina | 1937 | 27,000,000 | United Kingdom, United States, Germany |
| Bolivia | 1st half 1938 | 870,000 | Germany, Belgium, United States |
| Brazil | 1st nine months of 1938 | 15,000,000 | Germany, United States |
| Costa Rica | 1937 | 500,000 | United States, Germany |
| Cuba | 1st half 1938 | 4,700,000 | United States |
| Honduras | year ending July 1, '37 | 1,400,000 | United States, Germany |
| Guatemala | 1938 | 1,396,000 | United States, Germany |
| Haiti | 1938 | 700,000 | United States, United Kingdom, France, Germany, Holland, Belgium |
| Nicaragua | 1937 | 550,000 | United States, Germany |
| Paraguay | 1937 | 425,000 | |
| Peru | 1937 | 6,000,000 | Germany, United States, United Kingdom |
| Salvador | 1937 | 550,000 | United States, Germany |
| Uruguay | 1937 | 1,000,000 | Germany, United Kingdom |
| Venezuela | 1937 | 4,450,000 | United States, Germany, Belgium, United Kingdom |

* Based on World Chemical Developments—Dept. of Commerce 1939.

either a close second to or has preceded the United States as the principal country of origin for chemical imports in most of the Latin American countries. Argentina alone in 1937 still depended principally upon Britain as her source of chemical supplies—which was to be expected as the United Kingdom was her best customer.

In 1938, however, Germany's share of Argentina's chemical imports was greatly increased, and England, apparently, has lost her ascendency in this her last stronghold in South America. (According to the latest figures available which, while not complete for all countries, do show Germany's exports to South America for 1938.)

Next to Argentina, Brazil is the largest importer of chemical goods in South America and in that country Germany and the United States have been keen competitors for the bulk of the import trade. In Cuba, we have the larger share while in Peru, Germany has been ahead of us. Venezuela has given this country and Germany together the greater part of her trade, dividing the rest between Belgium and England. As for the other countries whose imports of chemicals amount to a million or more dollars a year (Colombia, Chile, Honduras, Guatemala) all have been importing most of their chemical needs from this country and the Reich.

Having seen then, that the United States has already a flourishing trade in chemicals with our Southern neighbors it is but logical to find out just what products we have been exporting to Latin America, and this we see in Table II which gives a detailed account of all items totalling over $10,000 exported to those countries for the year 1937—(items totalling less than $10,000 each were eliminated).

It is at once evident from Table II that, except for Paraguay, all the countries of Latin America purchase at least a part of their chemical supplies from us. And Paraguay is primarily an agricultural country using a relatively small amount of chemical products. Mexico is by far our best customer, purchasing chemicals worth over $6,000,000 in 1937, followed by Cuba, which

## Table II

### Exports from United States in 1937

(in thousand of dollars)

| *Products* | *Argentina* | *Bolivia* | *Brazil* | *Chile* | *Colombia* | *Costa Rica* | *Cuba* | *Dominican Rep.* | *Ecuador* | *Guatemala* | *Haiti* | *Honduras* | *Mexico* | *Nicaragua* | *Panama* | *Paraguay* | *Peru* | *El Salvador* | *Uruguay* | *Venezuela* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coal-tar and coal-tar dyestuffs | 273 | .. | 251 | 64 | 67 | .. | 120 | .. | 11 | .. | .. | .. | 381 | .. | 22 | .. | 16 | .. | 28 | 30 | 1263 |
| Copper sulfate | 13 | 17 | .. | .. | .. | .. | .. | .. | .. | 171 | .. | 687 | 116 | .. | .. | .. | 14 | .. | .. | .. | 1008 |
| Lead and calcium arsenates and other agr. insect. and fungicides | 79 | .. | .. | 24 | 21 | .. | 41 | .. | .. | .. | .. | .. | 141 | 13 | .. | .. | 101 | .. | .. | .. | 420 |
| Household and Industrial insect. and disinfectants | 96 | .. | 17 | .. | 80 | .. | 67 | .. | .. | 15 | .. | 13 | 61 | .. | 16 | .. | 23 | .. | .. | 146 | 534 |
| Baking Powder | .. | .. | .. | .. | 14 | .. | 42 | .. | .. | .. | .. | .. | 24 | .. | 18 | .. | .. | .. | 14 | .. | 112 |
| Textile specialty compounds | 12 | .. | 13 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 27 | .. | .. | .. | .. | .. | .. | .. | 52 |
| Tanning specialty compounds | 22 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 32 | .. | .. | .. | .. | .. | .. | .. | 54 |
| Water softeners | 175 | .. | 42 | .. | .. | .. | 14 | .. | .. | .. | .. | .. | 78 | .. | .. | .. | .. | .. | .. | 11 | 320 |
| Metal working compounds | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 19 | .. | .. | .. | .. | .. | .. | .. | 19 |
| Synthetic gums and resins | 20 | .. | 48 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 32 | .. | .. | .. | .. | .. | .. | .. | 100 |
| Aceto and nitro cellulose | 19 | .. | 73 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 92 |
| Cementing preparations | 97 | .. | 18 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 14 | .. | .. | .. | .. | .. | .. | .. | 129 |
| Shoe, floor and custom polishes | 16 | .. | 11 | .. | .. | .. | 110 | 11 | .. | .. | .. | .. | .. | 63 | 30 | .. | .. | .. | .. | .. | 241 |
| Miscell. chemical specialty compds. | 140 | .. | 46 | 36 | 216 | .. | 181 | .. | .. | .. | .. | .. | 516 | .. | 20 | .. | 55 | .. | 19 | 85 | 1314 |
| Acids and anhydrides | .. | .. | 15 | 12 | 55 | .. | 165 | .. | .. | .. | .. | .. | 62 | .. | .. | .. | .. | .. | .. | .. | 309 |
| Alcohols incl. glycerin | 13 | .. | .. | 20 | 49 | .. | 79 | .. | 14 | .. | .. | .. | 40 | .. | 19 | .. | .. | .. | .. | 11 | 245 |
| Acetone carbon bisulfide amylacetate | 32 | .. | 15 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 28 | .. | .. | .. | .. | .. | .. | .. | 75 |
| Flotation reagents | .. | 24 | .. | 151 | .. | .. | .. | .. | .. | .. | .. | .. | 112 | .. | .. | .. | 28 | .. | .. | .. | 315 |
| Miscell. org. chem. | 23 | .. | 64 | 13 | 25 | .. | 16 | .. | .. | .. | .. | .. | 80 | .. | .. | .. | 19 | .. | .. | .. | 240 |
| Potassium compounds (not fertilizer) | 27 | .. | 17 | .. | 25 | .. | .. | .. | .. | .. | .. | .. | 30 | .. | .. | .. | .. | .. | .. | .. | 99 |
| Sodium compounds | 585 | 15 | 494 | 65 | 128 | .. | 411 | 28 | .. | .. | .. | .. | 1216 | .. | 17 | .. | 32 | .. | 59 | 64 | 3114 |
| Miscell. inorganic compds. | .. | .. | .. | .. | .. | .. | 30 | .. | .. | .. | .. | .. | 12 | .. | 28 | .. | .. | .. | .. | .. | 70 |
| Gases | 42 | .. | 31 | .. | .. | .. | 41 | 17 | .. | .. | .. | 21 | 128 | .. | 11 | .. | .. | .. | 14 | 17 | 322 |
| Miscell. indust. chem. | 59 | .. | 33 | 24 | 45 | .. | 171 | .. | .. | .. | .. | .. | 171 | .. | 23 | .. | 46 | .. | 19 | 32 | 623 |
| Mineral earth and chem. pigment | 316 | .. | 50 | .. | 28 | .. | 115 | .. | .. | .. | .. | .. | 213 | .. | 75 | .. | .. | .. | 12 | 28 | 837 |
| Paints and varnishes (liquid and paste) | 350 | 22 | 254 | 89 | 360 | 55 | 428 | 63 | 24 | 81 | 24 | 33 | 400 | 26 | 156 | .. | 80 | 15 | 50 | 362 | 2872 |
| Nitrocellulose lacquers and thinners | 253 | .. | 179 | 29 | 33 | .. | 16 | .. | .. | .. | .. | .. | 214 | .. | .. | .. | 11 | .. | 14 | 26 | 775 |
| Nitrogenous fertilizers | 17 | .. | .. | 16 | .. | .. | 97 | .. | .. | .. | .. | .. | 179 | .. | .. | .. | .. | .. | .. | .. | 309 |
| Phosphate fertilizers | .. | .. | .. | 12 | .. | .. | 176 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 188 |
| Miscell. fertilizer mixtures | .. | .. | .. | .. | .. | .. | 72 | .. | .. | 11 | .. | 15 | .. | .. | .. | .. | .. | .. | .. | 26 | 124 |
| Explosives, safety fuses, blasting caps | 25 | 20 | .. | 298 | 93 | 16 | 104 | .. | 80 | .. | .. | 117 | 484 | 36 | 68 | .. | 280 | 13 | 67 | 118 | 1819 |
| Soaps | .. | .. | 13 | .. | 24 | 12 | 71 | 61 | .. | .. | 47 | 14 | 44 | 17 | 236 | .. | .. | .. | 15 | 36 | 580 |
| Dental creams | .. | 18 | .. | .. | 108 | 12 | .. | 19 | .. | 17 | .. | 17 | .. | 70 | .. | .. | 65 | 16 | .. | 125 | 467 |
| Cosmetics | 55 | .. | 64 | .. | 47 | .. | 80 | .. | .. | .. | .. | .. | 113 | .. | 110 | .. | .. | .. | .. | 79 | 548 |
| Biologics | 313 | .. | 83 | .. | 64 | .. | 276 | .. | .. | .. | .. | .. | 170 | .. | 12 | .. | 11 | .. | .. | 91 | 1020 |
| Druggists nonprop. prep. | 219 | .. | 97 | 13 | 260 | 31 | 630 | 12 | 12 | 38 | .. | 31 | 489 | 37 | 93 | .. | 82 | 30 | 15 | 175 | 2264 |
| Proprietary medicines | 198 | .. | 123 | .. | 536 | 31 | 563 | 61 | 12 | 37 | .. | 50 | 395 | 29 | 206 | .. | 132 | 38 | .. | 512 | 2926 |
| Total | 3489 | 116 | 2056 | 865 | 2278 | 157 | 4116 | 272 | 153 | 370 | 71 | 998 | 6021 | 291 | 1160 | .. | 1005 | 112 | 326 | 1974 | 25798 |

accounted for products worth over $4,200,000 and Argentina $3,500,000, then Colombia and Brazil, while Haiti and Paraguay were the smallest of our Latin American customers.

It is important to note that all the countries which imported any American chemicals at all bought paints and varnishes from us and that Haiti and Bolivia were the only ones of all our customers which did not also import druggists' non-proprietary preparations from this country, while these two with Brazil and the Dominican Republic were the only exceptions to the general rule of purchasing explosives from the United States.

### Trade of Belligerent Nations

In order to see just how these sales to Latin America may now be increased we must review the exports to these countries from the belligerent nations. This we have done in Tables III, IV and V which give the exports to Latin America from Germany, the United Kingdom and France respectively—for the last years for which figures are available. Due to lack of procurable statistics these tables are not as complete as the one for the United States, but they do indicate within broad limits the nature of the chemical products imported from the various European countries by the Latin American countries.

Principal exports from Germany in 1938 amounted to over $30,000,000 as compared to over $26,000,000 for this country, and we see at once that her position was particularly strong in South America. Brazil was her best customer, followed by Argentina then Colombia. Both Brazil and Argentina purchased over twice the amount of chemical products imported from Germany by Mexico which was the only one of the Central American republics whose imports of German chemicals exceeded $1,000,000 in 1938. Moreover, several of the countries of Central America confined their chemical purchases from Germany to pharmaceuticals.

The latter were certainly the Reich's best sellers in Latin America. They were the largest item on the list of chemical imports of each one of Germany's customers in Central and South America. Even Mexico, which depends so largely upon us for chemical supplies, bought German pharmaceuticals worth $2,474,000 in 1938 as compared with about $1,000,000 worth of the same class of chemicals from the United States. As for Brazil, Argentina and Colombia: their imports of German pharmaceuticals were several times more than the amount of such products purchased in the United States, while Bolivia seems to have limited her imports of pharmaceuticals entirely to the products from the Reich.

The second most popular German chemical imports in Latin America were explosives and ammunitions, but these products were purchased by none of the Central American states except Mexico.

Mexico and Cuba were the only ones of the Central American group to buy German coal-tar products in 1938, but the great South American nations, Argentina, Brazil, Chile and Colombia, imported much larger quantities of these products from Germany than from the United States. And one South American country, Paraguay, appears among Germany's customers but not among those of this country nor of the other two belligerent nations.

As for the United Kingdom—the principal exports of which to Latin America amounted to over $11,000,000 in 1937, as shown in Table IV; there really was very little competition from that source except in Argentina and Brazil.

Britain's market was even more strictly confined to South America than Germany's and included only Cuba, Haiti, Mexico, Panama and Costa Rica of the Central American states. Argentina, Britain's best customer, and Brazil imported British chemicals worth over $4,500,000 and over $2,800,000 respectively, but no other country of Latin America imported chemicals from the United Kingdom to the amount of $1,000,000.

Britain's largest sale of chemicals to Argentina was in the form of disinfectants and insecticides but, curiously enough, the latter country was the only one of the Latin American group to buy such products from Britain while several of the others bought these chemicals from us.

### British Alkali Trade

The second largest item on Argentina's list of British chemical exports in 1937 was that of sodium compounds, amounting to over $1,000,000, and these same products headed the list of Brazil's imports from Britain—in this case $1,573,000 worth.

Most generally popular of Britain's chemical products were paints and colors, but they were not purchased in large quantities even by Argentina, whose imports from Britain of these products amounted to only $699,000.

Principal exports from France to Latin America in 1937 amounted to nearly $11,000,000—even less than those of Britain, but France sold to a greater number of the Central American countries—as shown in Table V.

### Brazilian Purchases from France

Brazil was the best customer of France in Latin America, purchasing chemical products to the amount of $2,939,000. Next came Argentina, then Mexico and Cuba, and these completed the list of countries in this group which imported French products with a value of $1,000,000 or over.

Unfortunately, in the statistics available the largest item of French imports in Brazil is given as miscellaneous chemicals ($1,681,000). Of the classes of chemicals given French medicinal preparations were imported in the greatest quantity—both in Brazil, where they amounted to $486,000, and by all the other Latin American customers of France—Mexico purchased $1,053,000 worth of these products and Cuba $1,013,000.

## Table III

**Exports from Germany in 1938**

(in thousands of dollars—based on 1 mark = $0.402)

| Products | Argentina | Bolivia | Brazil | Chile | Colombia | Costa Rica | Cuba | Dominican Rep. | Ecuador | Haiti | Honduras | Guatemala | Mexico | Panama | Paraguay | Peru | El Salvador | Uruguay | Venezuela | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrogenous fertilizer | .. | .. | 424 | .. | 52 | 60 | 90 | .. | .. | .. | .. | 44 | 151 | 18 | .. | 109 | 23 | .. | 50 | 1021 |
| Coal tar and coal tar dyestuffs | 619 | 69 | 892 | 406 | 449 | .. | 44 | .. | .. | .. | .. | .. | 521 | .. | .. | 161 | .. | 239 | 29 | 3420 |
| Explosives and ammunition | 520 | 119 | 102 | 323 | 59 | .. | .. | .. | .. | .. | .. | .. | 55 | .. | 35 | 215 | 50 | 51 | 41 | 1570 |
| Photographic chemicals | 599 | .. | 347 | 114 | 85 | .. | .. | .. | .. | .. | .. | .. | 139 | .. | 14 | 90 | .. | 60 | 48 | 1496 |
| Paints, dyes and varnishes | 763 | .. | 664 | 360 | 203 | .. | .. | .. | 56 | .. | .. | .. | 80 | .. | .. | 141 | 50 | 198 | 94 | 2609 |
| Pharmaceuticals | 2555 | 173 | 3725 | 970 | 2348 | 110 | 436 | 71 | 148 | 24 | 91 | 195 | 2474 | 43 | 70 | 636 | 137 | 369 | 845 | 15120 |
| Synthetic chemicals | 196 | .. | .. | 74 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 38 | .. | 308 |
| Wax goods (fats and soaps) | 66 | .. | 92 | 36 | 64 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 17 | .. | .. | 52 | 327 |
| Potassium compds. incl. fertilizer | .. | .. | 180 | 70 | .. | .. | 56 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 306 |
| Phosphate fertilizers | .. | .. | 128 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 128 |
| Gelatine and glue | .. | .. | 44 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 41 | .. | .. | 8 | .. | .. | .. | 93 |
| Cosmetics | .. | .. | 67 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 44 | .. | .. | .. | 111 |
| Miscell. chemicals | 1589 | .. | 2595 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 64 | 4248 |
| Total | 6907 | 361 | 9160 | 2353 | 2951 | 170 | 626 | 71 | 204 | 24 | 91 | 239 | 3461 | 61 | 119 | 1421 | 260 | 955 | 1223 | 30757 |

## Table IV

**Exports from United Kingdom in 1937**

(in thousand of dollars)

| Products | Argentina | Bolivia | Brazil | Chile | Colombia | Costa Rica | Cuba | Ecuador | Haiti | Mexico | Panama | Peru | Uruguay | Venezuela | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disinfectants and insecticides | 1298 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1298 |
| Sodium compounds | 1024 | .. | 1573 | 154 | .. | .. | .. | .. | .. | 88 | .. | 68 | 122 | .. | 3029 |
| Paints and colors, etc. | 699 | .. | 154 | 116 | .. | 17 | 81 | .. | .. | .. | 42 | 117 | 81 | 79 | 1386 |
| Arms, Ammunitions, etc. | 225 | 30 | 295 | 61 | 205 | .. | .. | .. | .. | .. | .. | 231 | 56 | .. | 1103 |
| Drugs and med. | 144 | .. | 126 | .. | .. | .. | 111 | .. | .. | .. | .. | .. | .. | .. | 381 |
| Arms, amm., military and naval stores | 225 | 30 | 295 | 61 | 205 | .. | .. | .. | .. | .. | .. | 231 | 56 | .. | 1103 |
| Soap | .. | 24 | .. | .. | .. | .. | .. | .. | 242 | .. | 33 | 36 | .. | .. | 335 |
| Miscell. chemical products | 921 | .. | 427 | 390 | 295 | .. | 77 | 95 | .. | 265 | .. | .. | 162 | 144 | 2776 |
| Total | 4536 | 84 | 2870 | 782 | 705 | 17 | 269 | 95 | 242 | 353 | 75 | 683 | 477 | 223 | 11411 |

## Table V

**Exports from France in 1937**

(in thousand of dollars)

| Products | Argentina (1938) | Bolivia | Brazil (1938) | Chile | Colombia | Costa Rica | Cuba | Dominican Rep. | Ecuador | Haiti | Guatemala | Mexico | Nicaragua | Panama | Peru | El Salvador | Uruguay | Venezuela | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volatile oils and essences, synthetic perfumes | 146 | .. | 277 | 59 | 38 | .. | 94 | .. | .. | .. | .. | 41 | .. | .. | .. | .. | 32 | 30 | 717 |
| Perfumes and soaps | 305 | 9 | 278 | .. | 59 | 12 | 161 | 18 | 21 | 29 | 26 | 134 | 8 | 325 | 22 | 14 | 40 | 151 | 1612 |
| Glue | 31 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 31 |
| Dyes and colors, etc. | 286 | .. | 217 | .. | .. | .. | .. | .. | .. | .. | .. | 320 | .. | .. | .. | .. | .. | .. | 823 |
| Medicinal prepar. | 646 | .. | 486 | 60 | 732 | .. | 1013 | 48 | 29 | 11 | 44 | 1053 | 16 | 31 | 129 | 42 | 89 | 781 | 5210 |
| Miscell. chemicals | 507 | .. | 1681 | 114 | 46 | .. | 44 | .. | 22 | .. | .. | 83 | .. | .. | .. | .. | 52 | .. | 2549 |
| Total | 1921 | 9 | 2939 | 233 | 875 | 12 | 1312 | 66 | 72 | 40 | 70 | 1631 | 24 | 356 | 151 | 56 | 213 | 962 | 10942 |

But the French products universally popular throughout Latin America were of course, perfumes and soaps. Purchased by all the South American countries except Chile and Paraguay, in 1937, and by all the Central American states their total sales amounted to $1,612,000.

### How Far Can We Profit?

That American manufacturers can capture all of this lucrative market is somewhat doubtful, but there is no reason why we should not profit by Britain's forced withdrawal from her special market—that of sodium compounds and from her private preserve of supplying disinfectants and insecticides to Argentina.

### Substantial Gain Likely

As a matter of fact, except for French perfumes there is nothing now being manufactured by any one of the belligerents which we do not already or could not sell to Latin America. Consequently, American chemical manufacturers should soon see a substantial gain in their exports to both South and Central America.

# Modern Coatings

***A Collaboration By Gustavus J. Esselen, Inc., Arthur D. Little, Inc., and Skinner & Sherman, Inc.***

TWENTY-FIVE years ago we had paint and varnish, and their properties and uses were clearly defined and known to all.

Twenty years back the cellulose lacquers first appeared. They upset our conception of coatings and appreciably changed their use.

A decade ago the earliest of the synthetic resin lacquers came on the market. Again they widened the usefulness of coatings and very greatly complicated their selection.

Thus we may sum up a veritable chemical revolution in the coatings field. For the older paints and varnishes were all natural raw materials (oils, wood alcohol, pigments, gums, etc.) compounded by the strictly mechanical methods of grinding, dissolving, and mixing; but modern protective and decorative coatings are highly formulated and produced under scrupulous chemical control.

Chemical research has given us a new range of many highly specialized chemical compounds to preserve and beautify not only woods and metals, but also wallboard, cement, plastics, rubber, linoleum, fabrics, paper, and what not. More than this, coatings are designed not only for particular materials but also to meet special conditions. High temperatures or low; excessive humidity or extreme dryness; aloft in the air or deep underground; sun, salt water, even alkalies and acids; abrasion, stretching, and compression of the coated surface—all these, and other conditions of use in the most exacting and complicated combinations, are met today by specialized films. To the traditional brushing, dipping, and spraying, have been added new chemical methods of application.

It follows that the correct selection of just the best modern coating for the "paint job" of any commercial article from an airplane wing to an underground cable requires a very up-to-date knowledge of the latest developments in the coatings field. Progress is so swift that often it is wise to seek expert advice. Nevertheless a resume of the chief coatings groups and their uses and an outline of some recent developments will be useful to any manufacturer.

Protective films fall into one of the following classes: oxidizing oil films (ordinary paints), oil soluble varnishes (resin-drying oil combinations), spirit soluble varnishes (shellac), cellulose lacquers, synthetic resin (including modified forms) lacquers, cold water paints (kalsomine, casein paints), metallic base paints, coatings based on derivatives of rubber or on rubber substitutes, miscellaneous (mica, cork, ethyl silicate, etc.). On all of these types important developments have been made in recent years. Each offers outstanding properties or particular advantages for specific applications. In general, the new products are more expensive than the old, but their improved durability means a real saving.

Developments in oxidizing oil films have been concerned principally with drying oils, new pigments, and improved dispersion of pigments in oils.

A new method for speeding the drying of paint oils and decreasing the amount of driers necessary, developed by Technical Process Corporation, consists in processing drying oils with certain chromium chemicals. Lead leaf, copper paste, and aluminum bronze may be dispersed in these "chromatized" oils. Metals so primed have improved water resistance, and corrosion of the iron surface underneath such coatings is said to be inhibited more effectively than is the case in older rust proofing processes. Mica flake may also be dispersed in such oils to produce excellent priming coatings for metals, and to extend aluminum paste without loss of covering power. Similarly an asphalt cut-back for wet surfaces without harming the coating has been developed.

New types of driers have been developed to speed the drying time of paint oils. Probably the most im-

portant are those based on metallic soaps of naphthenic acid which is recovered in the course of refining certain types of Californian and European crude oils.

Political situations in Europe and the Orient have affected commerce in vegetable oils and oil seeds. The United States trade in these products has been further upset by certain import taxes imposed by Congress. An intensified, world-wide search has been made for satisfactory substitutes for such oils as linseed, tung, and perilla, three paint oils which are wholly or chiefly imported. A partial substitute for China Wood oil, or tung oil, has been developed by three companies, Archer-Daniels-Midland, Spencer Kellogg and Sons, and Woburn Degreasing Co., in chemically altered castor oil. Excellent varnishes and liquid enamels have been produced with this oil in combination with tung oil and synthetic resins, and its non-yellowing characteristic is particularly good. In the jungles of Brazil immense numbers of oiticica palms have been discovered whose nuts yield an excellent drying oil. Fair quantities of oiticica oil are now available, but difficulties of collecting the nuts, and of extracting the oil will limit the supply until gathering and production facilities in Brazil are more fully developed. Meanwhile, soybean oil, now produced in large quantities in the United States, is being constantly made more suitable for paint and varnish use.

Paint pigments, as well as the oils, have been improved by research and new coloring materials have increased the growing complexity of coatings ingredients. But pigments are colors with important uses outside this coatings field, and their developments are more logically considered along with the dyes and the dry colors, the lakes and toners—all sources of the colors all industry today uses so brilliantly.

A notable advancement in paint manufacture is the addition of certain chemicals to the paint mix which speed up the wetting of the pigments by the oil, reducing the time and labor formerly required for this operation. Nuodex Products Company, Inc., Elizabeth, N. J., manufactures a number of chemical products for this purpose.

To prevent fungus growth on both exterior and interior paints, fungicides are now added to paints. Both Dow's "Dowicides" and Monsanto's "Santophens" which are essentially chlorinated phenols, are employed for this purpose, as well as to treat lumber for prevention of green mould, and jap stain.

Serious research in India, England, and the United States seeks to improve qualities and find new uses for shellac. The work is wisely of a fundamental character. No startling commercial results are yet reported, but a new dewaxed shellac is on the market which keeps longer and still retains its solubility. It is also more reactive to heat and more thermo-setting than ordinary shellac. It is being used in resin-modified nitrocellulose lacquers. The manufacturer is Zinsser and Company. Elastolac is a new orange-colored, non-inflammable resin product of a chemical reaction of shellac, produced by Glyco Products Co. It dries rapidly to a flexible, glossy, adhesive film that is water soluble, but not affected by hydrocarbon solvents. Its value for cementing gaskets and the like which are exposed to gasoline, naphtha, etc., is obvious. In water solution it may be incorporated in latex mixes to give a product more resistant to oil and gasoline, for use in adhesives, insulations, sizings, polishes, for finishing rubber, textiles, metal, and paper, and as a dispersing agent for pigments.

## New Goods for

### Cellulose Derivative Lacquers

The quick-drying, hard-finish nitrocellulose or pyroxylin lacquers that appeared shortly after the war had revolutionary effects on the coatings industry. One of their drawbacks has been the chalking which occurs on outside exposure. In this respect they have been greatly improved by the addition of synthetic resins. A newer development is cellulose lacquer dispersions in water. A relatively thick paste made up of the base, pigments, and plasticizers is dispersed in water to form an emulsion. On evaporation of the water, the lacquer is deposited in droplets which coalesce to form a film. These emulsions have found wide acceptance in Great Britain, but are little known here except for coating textiles. Their advantages over the solutions in organic solvents are reduced fire hazard and lower costs.

Ethyl cellulose is a derivative of cellulose recently placed on the market by Dow and Hercules Powder. Besides applications in molded plastics and as transparent wrapping material, it possesses valuable properties for coating compositions, being stable to heat, light, and aging, of low flammability, and soluble in a wide variety of solvents. It imparts toughness, high flexibility and strength to lacquers and also to coatings applied in molten condition. It also gives lustre and finish to paper and is a desirable protective finish for textiles.

Another new cellulose derivative still very much in the developmental stage is cellulose acetate-butyrate, from the Hercules Powder Co. under the trade name "Hercose C" and Tennessee Eastman Co. under the trade name "Tenite XX." Although intended primarily for plastics, its great moisture resistance compared to other cellulose derivatives used for surface coatings renders it of interest, and it appears particularly suitable for clear finishes on metals, especially brass, in place of nitrocellulose lacquers, because of excellent resistance to sunlight.

Still a third cellulose product which is in commercial production in England and Germany, but has not yet come out of the research laboratories of two American

companies known to be working on it, is benzyl cellulose. This material is said to be superior to ethyl cellulose in several respects.

Most important of all new types, however, are the lacquers based on synthetic resins of which there are many kinds. The first were based on phenolformaldehyde resins which form a hard, continuous, uniform coating not affected by changes in temperature or humidity. These are insoluble in organic solvents and resist dilute acids and oils. Their excellent insulating properties, heat resistance, non-chalking characteristics, and toughness make them valuable coatings for metal surfaces. They have covering power up to 2,000 square feet per gallon, are applied by the usual methods, and are free from the fire hazards of nitrocellulose lacquers. Extensive use has been made of them on small metal parts such as novelties, vanity bags, hardware, factory equipment and office appliances.

As recent examples, card table top finish not harmed by burning cigarettes is Tuf-On No. 216, a burn-proof enamel based on Bakelite resin. Devoe & Raynolds have developed a phenolic type of coating for floors which penetrates the wood cells and so becomes almost an integral part of the wood, thus providing unusual wear resistance. Certain phenolic heat reactive resins are found exceptionally lasting when applied as protective coatings to ships' propellers. Among the principal manufacturers of phenolic resins of this type are the American Cyanamid Co., Bakelite Corporation, Du Pont Company, Reichhold Chemicals, Inc., Resinous Products and Chemical Co., and Stroock & Wittenberg.

The most rapidly growing development among synthetic lacquers is among the alkyd resins. These are made from phthalic anhydride or other acids of similar type, and glycerin or related products. This growth is shown by the increased production of phthalic and maleic anhydrides, both used almost exclusively for this purpose, from 9,931,000 pounds in 1933 to 61,254,000 pounds in 1937.

These resins are made in many different modifications to yield desired properties for specific applications. The modifying agents may be drying, semi-drying or non-drying oils, or their fatty acids; a natural resin, or other types of synthetic resins. As a class, lacquers based on alkyd resins are characterized by their excellent adhesion to metals, and their chemical resistance to weak acids, alkalies, and most solvents. They are more stable than the phenolic type of finishes, withstand higher temperatures, are available in a wider range of colors and are quick drying.

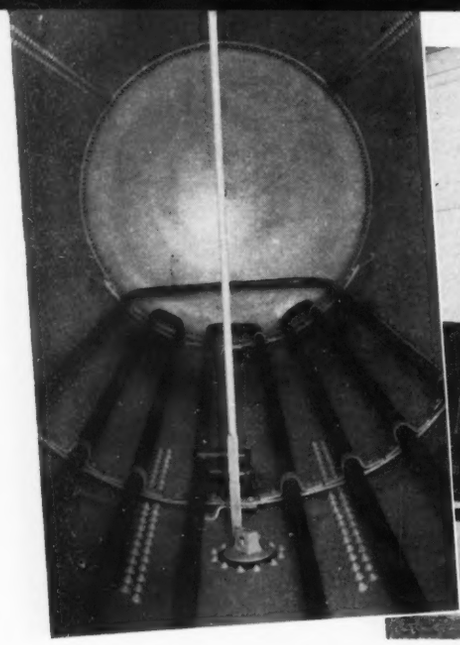
The lack of color, excellent transparency, hardness, and freedom from after-yellowing possessed by urea-formaldehyde resins could not be utilized in coating formulations until methods were devised for overcoming their brittleness and insolubility in organic solvents. They are now available as water-white viscous solutions, but are seldom used alone because of the hardness, brittleness, and lack of adhesion of their films. Combined with alkyd resin bases they impart hardness without detracting from color to yield excellent coatings which are mar-proof, resistant to alcohol, grease, oil, and fruit acids. Such coatings are available in all colors and are especially suited for use on refrigerators, bicycles, toys, metal furniture, kitchen cabinets, and washing machines, and as coatings for cans and drums. Addition of small amounts of concentrated oil soluble phenolic resins to alkyds also greatly hardens alkyd baking enamels, but with some sacrifice in color. Addition to pyroxylin lacquers improves adherence and durability of the latter.

One of the newest and most interesting synthetic resins is the methacrylate group. Their optical properties are superior to glass, and films of this material are harder than those made of any other synthetic resin.

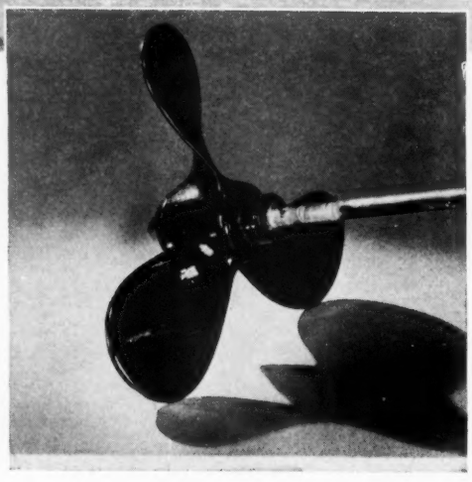
### The New Methacrylate Group

Liquid forms of methacrylate resins are available in two types—unpolymerized viscous syrups, and solutions of the resin in organic solvents. The unpolymerized forms, in which the chemical reaction has not yet been completed, are used to impregnate wood, cloth, wallboard, paper, electric coils, tile or stone. Polymerization or completion of the chemical reaction then takes place within the materials which find wide application especially in the electrical and food packaging industries. Can linings for beer, wine, vinegar, gasoline, and dilute acids have been suggested as uses, as well as baking finishes where permanent high gloss and non-yellowing are desired. Numerous types of laminations may thus be made, as for example in the aircraft field and for lamp shades. The solutions of methacrylate resins are used for clear surface coatings especially on non-ferrous metals such as aluminum, chromium, and brass, undercoatings on difficult adhesion jobs, also for impregnating paper and textiles, and in insulation. They may be brushed, sprayed, dipped and baked. The quick-drying clear film has an elasticity of 1,000 per cent. at room temperature and its light transmission lies between that of ordinary window glass and quartz. Baking is recommended for better gloss and adhesion, and a harder film.

Odorless, tasteless, non-toxic, thermoplastic and stable, the vinyl resins of Carbide and Carbon Chemicals Corporation find widespread use in coating inside surfaces of food containers, especially beer cans. One form, Vinylite VYN is used in lacquers, coated paper, floor tile, and felt impregnation. Vinylite VYC, compatible with nitrocellulose, is used in lacquers and finishes for industrial applications. The Hume Pipe Company, Inc., of New England, has developed a vinyl resin



Above, to the left, an important use of "Pliolite"—the lining of tank cars for the transportation of 50 per cent. caustic soda. Three coats of this rubber derivative are applied directly to the sand-blasted surface of the car. Center, this is how one company solved the problem of demonstrating its industrial coatings to its trade located in various parts of the country.



Above, the metal panel to the left treated with Hastolite Bakelite resin coating still retains its original gloss after two years' test in gasoline, hot salt water and moist air. Right, the reverse of metal test panel uncoated. Note rusting, pitting and scaling. At the left, note how perfect this resin-coated finish is on the propeller but how corroded the shaft is.

lacquer for food packages and industrial applications which has been very successful in coating tanks for resistance to acids.

The synthetic drying oil known as "S.D.O." (divinyl acetylene), developed by Du Pont, is a byproduct of Neoprene synthetic rubber. S.D.O. in paints and varnishes undergoes chemical change after application, thus permitting successive coats of the material to be applied without softening previous coats. The films are brittle and suitable only for rigid metallic surfaces. Some hazards exist in handling and applying coatings based on S.D.O. The clear, amber, quick-drying film is not attacked by acids, alkalies, ammonia, or by any combination of solids, but is attacked by strong oxidizing agents such as nitric acid. The films are used chiefly for protecting steel against water, acids, alkalies, and lubricating oils, and have been successfully used in lining tank cars and vessels.

The Arochlors, or chlorinated diphenyls, made by Monsanto, are of particular interest for adhesives and coatings formulation, because of non-flammability and good electrical properties. This heat-setting material adheres strongly even to smooth glass, polished metal, and varnished wood. It is applied hot without solvent, and it sets immediately upon cooling. Being non-drying no noticeable oxidation occurs even when exposed in thin films to the air. When used as ingredients of lacquers, the Arochlors do not slow up the drying of the film and they are remarkably slow to the action of hydrodizing agents or high temperature. They are not affected by boiling caustic soda solution. Their value for such applications as flame-retarding ingredients, softeners, adhesives, and organic pigments is obvious. In particular they have been employed for moisture proofing paper and radio resistors, and waterproofing such articles as abrasive wheels.

Low cost synthetic resins are derived from resin-forming constituents obtained in the process of cracking petroleum. These resins, though dark colored, are hard, neutral, and soluble in drying oils. Produced by the Pure Oil Co. they find outlets principally in formulation of inexpensive protective coatings for metal surfaces.

Hercules Powder has developed several synthetic resins for protective coatings. Petrex Resin, of the alkyd type, is produced from the terpenes of turpentine and maleic anhydride. It is used in lacquer varnishes, synthetic enamels, and printing inks. Abalyn (methyl abietate) is a derivative of the principal acid in resin. Hercolyn is hydrogenated Abalyn, a water-white, liquid, non-oxidizing and light stable resin. Used in nitrocellulose and ethyl cellulose lacquers, and as a resin plasticizer it improves their resistance to water. Vinsol resin, a less expensive, hard, high melting point, dark colored, resinous material, is used for insulating compounds and finishes, and for incorporation into spirit varnishes and stains, and nitrocellulose lacquers where pale colors are not essential.

Hydrogenated resin was announced by the same company in 1938, under the name of "Staybelite." Compared with rosin, discoloration is practically eliminated and brittleness greatly reduced. Substituted for ester gum in modified synthetic resins it reduces oxidation and increases color retentiveness. In adhesives it gives longer life and less embrittlement. Surgical and other adhesive tapes retain their effectiveness in long storage when the adhesives contain Staybelite.

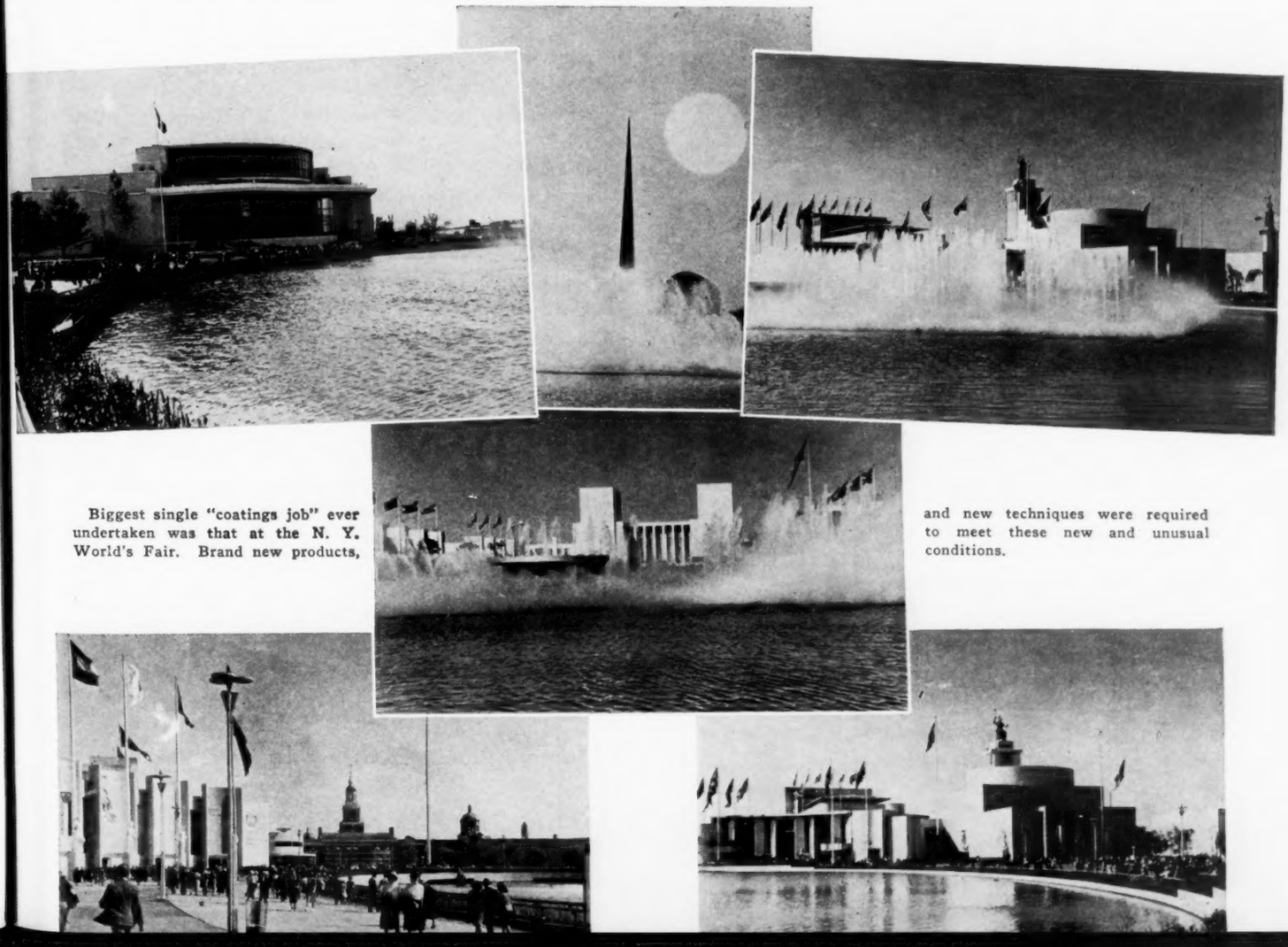
Flat emulsion paints based on synthetic resins are popular in England, and will doubtless become important in this country. Hitherto these paints have not been homogeneous in nature, but this defect has been overcome. Two leading types of resins available in the United States for such paints are "Aquaplex," a urea-formaldehyde product made by Resinous Products and Chemical Co., and "Beckasol 1500," manufactured by Reichhold Chemicals.

### Casein Coatings

Although long known, casein paints were not of importance because they deteriorated and had to be sold in powder form. Methods have been found, however, for treating the casein so that solutions do not deteriorate on keeping, and now 5,000,000 gallons are consumed annually. Their advantages lie in 20 or 30 per cent. lower cost than ordinary oil paints, in giving 5 to 15 per cent. greater reflection of light, freedom from odor of solvents and thinners and from fire hazards, and quick drying. Offices decorated with casein paints during the night may be occupied the next morning. These paints are available in a wide range of beautiful pastel tints. Addition to these paints of 2 or 3 per cent. mica has improved their washability, and of small amounts of water-dispersed titanium dioxide or lithopone, their hiding power.

"Protoflex," manufactured by Glyco Products, is a straw-colored, transparent jelly obtained as a chemical reaction product of casein which may be kept indefinitely. Dissolved in water without heat, it dries to an almost colorless transparent film. When mixed with latex to the extent of 10 to 15 per cent. of the dry rubber content, it acts as an efficient stabilizer. Added tackiness of the final product is obtained by use of larger quantities. The product has useful applications in adhesives, insulations, polishes, sizes, etc. "Casco-Resin," manufactured by Casein Company of America, is a new form of casein particularly suitable for manufacture of plywood. The plies are cured under pressure and produce strong, durable, waterproof joints. At 70° F. the material hardens in 1½ hours and at 50° F. in from 5 to 6 hours.

Chlorinated rubber for formulation of enamels, lacquers, and varnishes has been commercially available for some years, but only comparatively recently have certain defects in the product been overcome, and is being consumed in increasing quantities for modification of alkyd resin lacquers and enamels and in the formulation of paints. Chlorinated rubber finishes are



**Biggest single "coatings job" ever undertaken was that at the N. Y. World's Fair. Brand new products, and new techniques were required to meet these new and unusual conditions.**

particularly suited for surfaces exposed to alkaline conditions. They resist alkaline soaps, most acids except acetic, most common chemicals, bleaching agents, corrosive gases, mineral oils, gasoline, and salt water. They prevent mildew and mold growth and possess good outdoor and indoor durability. These properties lead to their use in steel, chemical, textile, paper, gelatine and gas plants. High resistance to abrasion makes chlorinated rubber paints among the most durable for marking traffic lanes. Inhibiting of barnacle and scum formation on ships' bottoms, coating paper and textiles for chemical and water resistance, and stop-off finishes for protection of electro-plating equipment are other applications for which its properties are particularly suited. As a modifier for alkyd type lacquers, it hastens drying and increases alkali resistance. Such modifications are being used to paint concrete.

### Rubber Derivatives

Pliolite, a rubber derivative described in "Rubber and Its Substitutes," (*Chem. Ind. Aug.* '39, *Vol.* 45, *page* 140), is used as a paint resin. It is hard, lustrous, corrosion resisting, suitable for formulation of paints resistant to acids and alkalies, moisture, fumes, and fungus; for emulsions and hot wax combinations for porous surfaces to give wax hardness and to eliminate fire hazard. Pliolite is not discolored by ultra-violet or sunlight; has high dielectric strength and resistivity; is compatible with many plasticizers and resins; miscible with most resins, waxes, and oils; is highly water-vapor proof in thin films; may be emulsified; accelerates drying, causes "flatting," and improves toughness of varnishes.

### Miscellaneous Materials

A new type of metallic lead pigment, "Metalead," is now available corresponding to flake aluminum. It gives a continuous, non-porous acid resisting surface. A cork insulating paint, which may be brushed or sprayed has these advantages cited in its use: easy application of thermal insulation, sound insulation (especially on metal shelves and drawers, bedside tables in hospitals), attainment of an adherent, moisture and corrosion-resistant, durable film coating. It is sold under the trade name "Corkene." Large quantities are made in battleship gray, but other colors are prepared to order.

Coating the inside of high pressure boilers to inhibit corrosion and scale formation had never been successfully accomplished until research developed a new graphite paint which steam boiler insurance companies have recommended. Another "impossible paint job," the coating of creosote treated wood has been solved by Creocote, developed by Reilly Tar & Chemical Corporation.

A radical departure in surface-protecting coating is "Amercoat," which may be applied with paint-spray equipment, yet is not a paint. It is a compound of chemically inert plastics and solvents to which have been added certain inert solid substances such as finely divided silica. Application is by two, three, four, or more separate coatings which build up a plastic, corrosion-resistant body that neither peels nor chips off, is sufficiently hard to withstand much abrasion and erosion, and will not check, crack, or fracture when subjected to vibration or pounding. It is unattacked by acids, alkalies, or other corrosive agencies except certain coal-tar derivatives such as phenols, and is not subject to destruction by electrolysis. Amercoat is particularly suited to applications on steel structures and equipment, concrete, wood, ships, etc., subject to corrosive conditions. Aluminum, copper, lead, and other metallic coatings are also available for tank structures where complete proof against electrolysis is not required.

Ethyl silicate is silica combined with ethyl alcohol to form an ester. When hydrolyzed with water it forms a flexible film of hydrated silica which may be pigmented. Such coatings have found extensive use abroad for decorating porous cement, plaster board, concrete, and stone surfaces. They are adapted to metal surfaces maintained at temperatures as high as 1000° F. The coatings are not attacked by dilute alkalies or acids (except hydrofluoric acid) and are, therefore, extremely useful in chemical laboratories. Being harder than almost any other paint film, they can be scrubbed with various cleansing agents without detriment. Their chief disadvantage is that they must be used within a month after manufacture. The coatings are not made in the United States, but ethyl silicate is manufactured here by Carbide and Carbon Chemicals Corporation.

The old question whether or not rust should be removed from structural iron before it is given a protective coating has been answered in one way by the development of a paint with a calcium filler which reacts with the oxides of iron to change them to inert calcium ferrite. Such paints are valuable as primers on structural steels. Several bridges so treated have shown no signs of rust after a number of years. A similar rubber base paint produced by Harrington Paint Co., known as Rust Eeter has proved valuable in painting steel sashes. Lead suboxide, manufactured by U. S. L. Battery Co., has also been used to inhibit rust, as the compound undergoes slow transformation to metallic lead which is bonded by the drying oil vehicle. Preparation of galvanized iron surfaces for better retention of surface coatings may be accomplished by using Lithoform, a product of American Chemical Paint Co.

And so it goes—inside or out; for rigid steel, flexible rubber, porous brick; to meet all conceivable conditions of use, special coatings are being improved with bewildering rapidity and most satisfactory result. Any manufacturer, whether he is making battleships or baby carriages, is only prudent today if he investigates widely to assure himself that he is using just the best, the cheapest, the most easily applied coating to his finished article.

**Robert Gould**
Heyden Chemical Corporation

# Should "P.A.'s"

## *Be Chemically Trained?*

***IF chemical salesmen should be chemically trained as Ernest Bridgwater of Du Pont insisted in an article in Chemical Industries several months ago, why not chemically trained purchasing agents? To answer this query, received from many of our readers, we turned to "Bob" Gould, purchasing agent of Heyden Chemical. Not only does he answer the specific question, but soliloquizes on many phases of the work of the average "P. A."***

HOW should a person be trained to qualify as a purchasing agent? That is the real question. But who knows—who can answer the question? For how long will it obtain? That's another real question. If you desire an answer to meet present conditions or requirements, that is very simple.

If the growth of the wealth and industries of our nation had been gradual over a long period of years, the tempo of the present age would be different. Developments of the past 40 years have been greater than ever before in history. Motion pictures, automobiles, radio, television, aeronautics, things electrical, mechanical and chemical. Every edition of our semi-monthly or monthly periodicals greets us with a gorgeous display of something new, something different. Those of us who have witnessed this period of development, are overwhelmed with wonder—a dream in reality.

### The Machine Age

Camera lenses and automatic devices, faster than the eye or the hand of man, spun glass, artificial fabrics, plastics, streamed-lined locomotives—like the sky rocket bursting over-head in kaleidoscopic sprays, so are new products showered upon us literally speaking with the turn of the hour hand.

With it all, are we progressing? Yes, but only in a material way. Is this march of progress creating more happiness? No, something is lacking. Therefore, are we really progressing, or is it a paradox? We call ourselves civilized and we are boastful of our accomplishments in arts and sciences, literature, music, we are proud of our brilliant legal minds, our statesmen and industries, but world-wide conditions today do not indicate that we are approaching the goal in our pursuit of happiness.

Where are we going next? The pace is so rapid, it is impossible to prophesy. That is why I say, who knows, who can answer the question, and how long will it obtain?

### Education at Our Universities

Advancement in education has also followed the pace, and our universities are turning out graduates in greater numbers than ever before. It is not a question today whether a young man entering business should be college trained or technically trained—they are.

In the earlier days when industry was in its infancy, then it was a privilege for a young man to enter business or learn a trade for little or no pay, as an apprentice. Not unlike the Horatio Alger stories, so familiar to many of us, whose hero was the boy who rose from bootblack to president.

Can you picture the chances of an office boy today, with a grade school education ascending to the presidency of a corporation? Let us not discredit the ability of our men of the earlier period. This training matter and skill are evidenced by our inheritances. But what has all this to do with the requirements or qualifications that go to make a purchasing agent?

Since the point in question relates to education or training, it should not be taken amiss to compare the past with the present. What the future holds forth, time alone can tell. Should a purchasing agent be chemically trained?

I might be so daring as to say preferably not—a college training yes, but a technical training unnecessary. In speaking of the purchasing agent in the chemical industry, I refer to the general purchasing agent and not a specialist.

### A Staff of Purchasing Agents

Some of our corporations are so large and their interests so wide and varied, they require a large staff

of purchasing agents. In such cases, the items purchased may be grouped or classified and the services of technically trained men may be quite necessary. This type of purchasing agent may be referred to as the specialist.

In a general sense chemical products are standardized. For refined chemicals, medicinal, pharmaceutical or those entering into food products, we have The Pharmacopeia, C. P. Standards, and specifications set up by government departments. The industrial chemicals or those required for technical purposes are identified by specifications. The question is what are the requirements for the particular job.

Knowledge is always helpful, but when speaking of a trained mind, whether it be scientific, chemical, mechanical or legal, if the individual possesses greater knowledge in any of these branches than the job of purchasing requires, then that individual should find his place where his knowledge can be used to the fullest extent and to the best advantage.

In the chemical industry we have our control men, research laboratory directors and plant managers, all highly trained technical minds. They have a definite, fixed place in an organization. They may be called upon when any technical assistance is required in a purchasing transaction.

### A Practical Chemical Knowledge

If the purchasing agent is not technically trained, so far as the internal relations of an organization are concerned, it might prove conductive to greater harmony. If the purchasing agent's operations are not confined strictly to the technical field, he should at least have a practical knowledge of chemicals or chemistry.

This may be acquired through experience in the course of time. It is impossible for a general purchasing agent to be technically trained in all branches. In the purchases of chemicals, should he be a chemist, or for automotive equipment, a mechanical engineer, or for electric motors or equipment, an electrical engineer, or for bookkeeping machines a mechanical engineer, or accountant?

Should he be an efficiency expert, or for the legal aspect of his duties, should he be a lawyer?

Purchasing is a profession requiring certain definite qualifications, knowledge or training—the theoretical, or fundamentals may be acquired in a business institute, but like all other occupations, the practical experience is necessary.

Business ethics play an extremely important role in the life of a purchasing agent.

The purchasing agent should have a practical knowledge of all the products he purchases. He should be mindful at all times of his responsibilities—be familiar with market prices and trends.

### The Organization of His Department

The wording of purchase orders and contracts—and some of the legal aspects—foreign markets, customs, weights, measures and foreign exchange—commercial letters of credit, bank documents and procedure, adjustment of claims—inventories, the sale of reclaim materials, scrap and salvage, etc., should be knowledge that he has at his finger tips or should know where to get it.

In fact, I believe that the purchasing department has more to contend with than the sales department, for the reason that the sales department is only concerned with the products manufactured or traded in by its company; whereas the purchasing department must be familiar with all the markets and materials required in the respective departments that constitute the organization.

### Acquaintance with Salesmen

Regarding the application of knowledge or training, this is where we reach the point in the matter of treating with our fellow man. It would be of very little value unless we had the ability to get along with the other fellow. Some purchasing agents consider themselves and their time so important, they are too busy to be seen, only blinded by their own stupidity.

To those purchasing agents I might say come down from that mythical pedestal and get acquainted with the salesmen. It pays dividends.

Thanks to the progress of the present age we have our various associations for manufacturers, salesmen, purchasing agents, credit men, accountants, comptrollers and traffic men. The departments of our corporations should be represented therein. Such contacts promote a better understanding of our business problems—principles and practice, and they learn to live and let live.

### Entertainment Pays Dividends

Under the heading of ethics, there is one phase I would like to touch on, that is entertainment. Perhaps it is just another one of those traditions. I don't know why a salesman considers it desirable or necessary to entertain a purchasing agent. In my opinion the purchasing agent needs the salesman just as much as the salesman needs the purchasing agent—and at times, more so. I consider it very important and advisable that the purchasing agent spend a certain amount of time with the salesman on social grounds or on the field of sport. But in that connection, I should like to state that there is no reason why a purchasing agent should not have an expense account. Furthermore, I am firmly of the opinion that a purchasing agent should

accept entertainment on one condition only—that he return it. That pays dividends also, and I think that if every corporation or business enforced that rule, it would lend more dignity.

I recall a verse that read something like this:

"And some day when the Great Scorer comes—
To mark against your name—
He will not mark you won or lost
But how you played the game."

### Purchasing Agent—A Misnomer

In conclusion I might add that, although I have referred throughout this article to the title purchasing agent, I believe that it is a misnomer and I disagree when it is applied to a department head or assistants, when the department is an integral part of a corporation or business. We don't call our sales managers sales agents.

There are individuals or organizations who are in the true sense purchasing agents, but they are separate and apart from the principal whom they represent.

Time for a little tailoring of titles in this stream line age—don't you think?

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# Industry's Bookshelf

**Chemical Gardening,** by Charles H. Connors and V. A. Tiedjens; Wm. H. Wise & Co., N. Y.; 130 pp., $3.00. Not the first but the most practical book on the soilless growth of plants; explicit directions for flowers and vegetables and workable suggestions on the little tricks learned only by experience.

**The Plant Alkaloids,** by Thos. Anderson Henry; Blakiston's, Phila.; 689 pp., $5.00. Third edition of this standard work which has been entirely rewritten and so is virtually a new work and much enlarged. Classification follows molecular structure and the approach is from the chemical point of view.

**Scientific Aspects of Artist's and Decorator's Materials,** by R. S. Merrell; Oxford Univ. Press, N. Y.; 141 pp., $2.00. From colored clay pounded into bone marrow to synthetic pigments, thermoplastic resins, and chlorinated rubber is the scope of this excellent book which is a conspicuous success in condensation and clarity for the layman's use.

**David Ames Wells,** by Fred Bunyan Joyner; Torch Press, Cedar Rapids, Iowa; 244 pp., $2.50. Timely résumé of government finances after Civil War, told in life history of a chemist who became author and ended one of the best-informed economic advisers to Abraham Lincoln.

**Research Applied to Business Education,** by Benj. R. Haynes and Clyde W. Humphrey; Gregg Pub. Co., N. Y.; 218 pp., $2.00. Working models of questionnaires, statistic collection, reference recording, from the college point of view.

**Qualitative Organic Chemistry,** by Neil Campbell; D. Van Nostrand Co., N. Y., 213 pp., $2.60. Exposition of methods is good, particularly on newer reagents, but the check list of analysis of practically all the organic compounds ordinarily met in pure form is excellent.

**Patents and the Public Interest,** by H. A. Toulmin, Jr.; Harper's, N. Y., 205 pp., $2.50. If you doubt the value of the patent system to the entire chemical world you should read these pages which set forth the facts both favorable and unfavorable of the workaday patent system of this country.

# New Processes

### Manufacture of High-Octane Gasoline

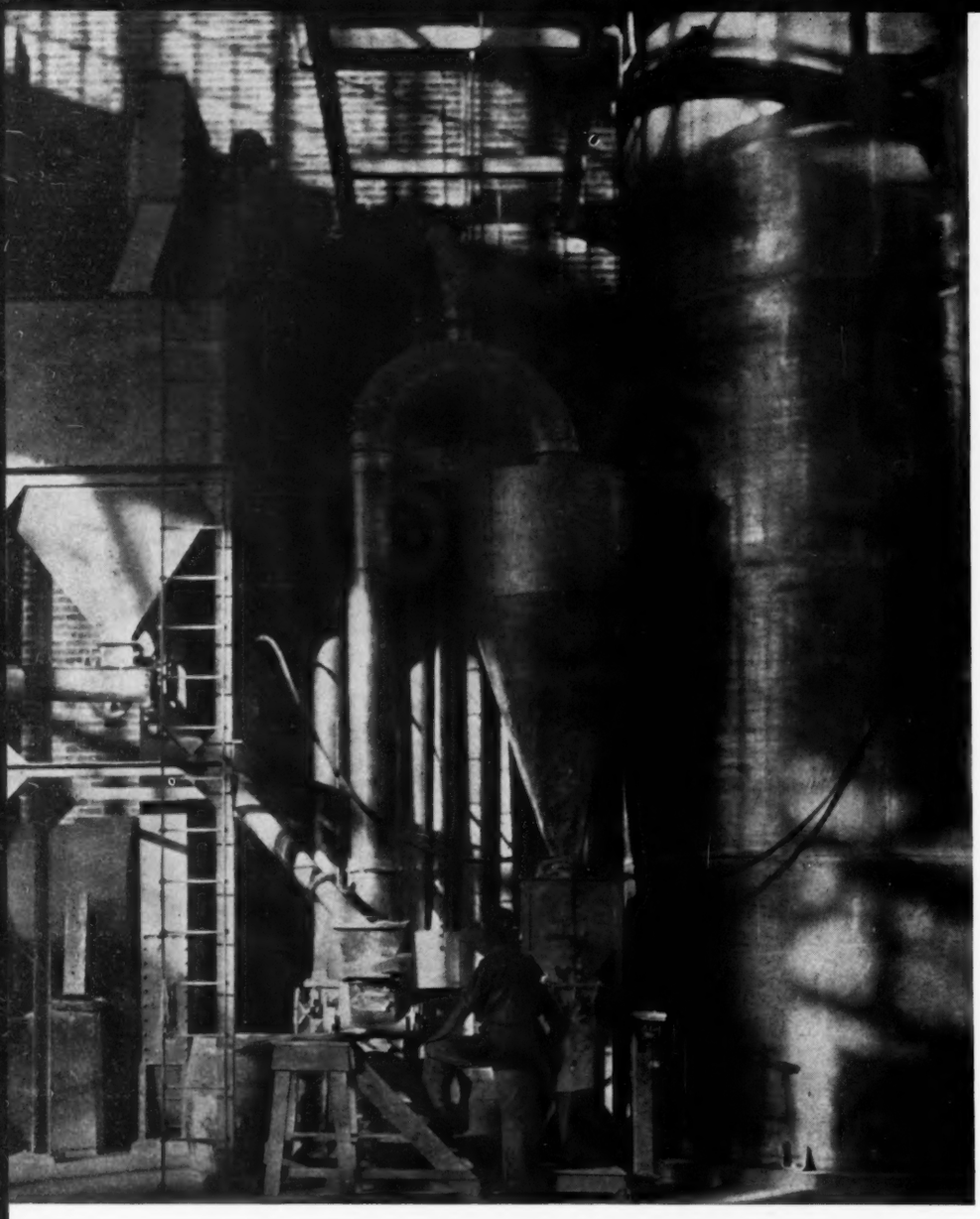
Ipatieff and Pines, of Universal Oil Products' laboratories, have been granted U. S. Patent No. 2,170,306 for a process yielding an octane-rich gasoline. Method consists, essentially in causing isobutane to condense with normal butylenes. The gases are mixed and passed over anhydrous aluminum chloride at temperatures of 0° C. and lower.

### Resinous Polymers from Sulfur Dioxide and Olefins

Sulfur dioxide can be condensed with vinyl chloride in the presence of paracetic acid catalyst, according to L. H. Dunlap in his Ph.D. thesis submitted to the School of Chemistry, University of Illinois. A 10% yield was obtained, showing some tendency to form a composition of plastic-like physical properties. It was unchanged at 165° C.; X-ray studies indicated a definite orientation in structure. Unilke other known polysulfonic complexes, this polymer is reported to contain 2 molecules of olefin per molecule of sulfur dioxide. On heating, it loses both sulfur dioxide and hydrogen chloride. It is said to be resistant to the action of concentrated nitric acid. Marvel and Frederick, University of Illinois, are continuing this study of polysulfone condensates, and report the preparation of certain of these resinous materials in U. S. Patents Nos. 2,169,363 and 2,169,364.

### Reaction of Fatty Acids to Metals

An interesting report on the manner in which metals are attacked by fatty acids has been presented to the French Academy of Sciences by Dubrisay and Goupil (*Compt. Rend. 207*, 1,101). In principle, the authors state, fatty acids only attack metals superficially *in vacuo*. In air, if the acid covers the metal entirely and no water is present, no attack seems to take place. Tests were made with a 5% solution of acetic acid in water and in distilled xylene. Copper strips were placed in test tubes and covered with the solutions so that in the first tube the copper was entirely covered with xylene solution; in the second, half covered with xylene solution and half exposed to the air; in the third, half covered with aqueous solution and half with xylene; in the fourth, entirely covered with aqueous solution on the top of which xylene floated without touching the copper; in the fifth, entirely covered with aqueous solution; and in the sixth, half covered with aqueous solution and half exposed to the air. After two months, the copper in the first tube was found unattacked; in the second a deposit amounting to 0.045 mg. was found on the exposed part; in the third the aqueous solution contained 0.030 mg. of salt in solution with a deposit of 0.011 mg. on the copper immersed in the xylene solution; in the fourth there was a solution of 0.005 mg. of salt in the water layer; in the fifth there was 0.008 mg. of salt in the aqueous solution; and in the sixth there was 0.031 mg. of salt in the aqueous solution and on the exposed part of the copper there was a deposit of 0.06 mg. The results show that when the metal is completely immersed in one liquid, there is little or no attack; when two liquids touch the metal, an Evans battery would seem to be formed, the copper being attacked electrolytically with salt formation.



Natural gas is used at the St. Louis plant of Monsanto for many processes involving organic synthesis, requiring very precise temperatures and difficult vacuum distillations.

# Monsanto Fuels for Precise Temperature Control

**GAS, both manufacturing and natural, is more widely used in large-scale chemical manufacturing operations than is generally believed. Advocates of the use of gas claim three specific advantages over other fuels—cleanliness, economy, and lower handling and maintenance costs—important factors.**

IN the varied manufacturing processes performed by Monsanto Chemical Company, heat is a tremendously important item, not only from the standpoint of fuel costs, but from the standpoints of flexibility and precise control of temperatures. The fact that the company produces over 300 different industrial chemicals ranging from heavy products such as sulfuric acid and hypochlorite of soda to plasticizers, dry ice, and the finest of medicinals, indicates how diversified its fuel requirements must be.

At Everett, Massachusetts, Monsanto has selected manufactured gas and standard low-pressure velocity burners to heat stills, cookers and reboilers associated with phthalic anhydride units. More flexible heat for the converters themselves is obtained with the same fuel, but with combustion controlled by low-pressure, automatically proportioning, burner equipment "Gas," it was learned, "is employed because extremely accurate temperature control is necessary for maximum efficiency in the catalytic reaction essential in the manufacture of phthalic anhydride."

Natural gas is economically available to the St. Louis, Missouri, Monsanto plant direct from Louisiana wells, and is used liberally in those operations "characteristic of organic synthesis." According to one spokesman for the company, "In general, gas is used in carefully

designed fire-brick furnaces surrounding kettles in which temperatures are required beyond those attainable through steam. Our experience over a period of several years has been that this type of heating is most easily controlled and not hard on equipment." Pictured on the opposite page is equipment for a difficult vacuum distillation where the ultimate in temperature control is paramount.

### Use of Natural Gas

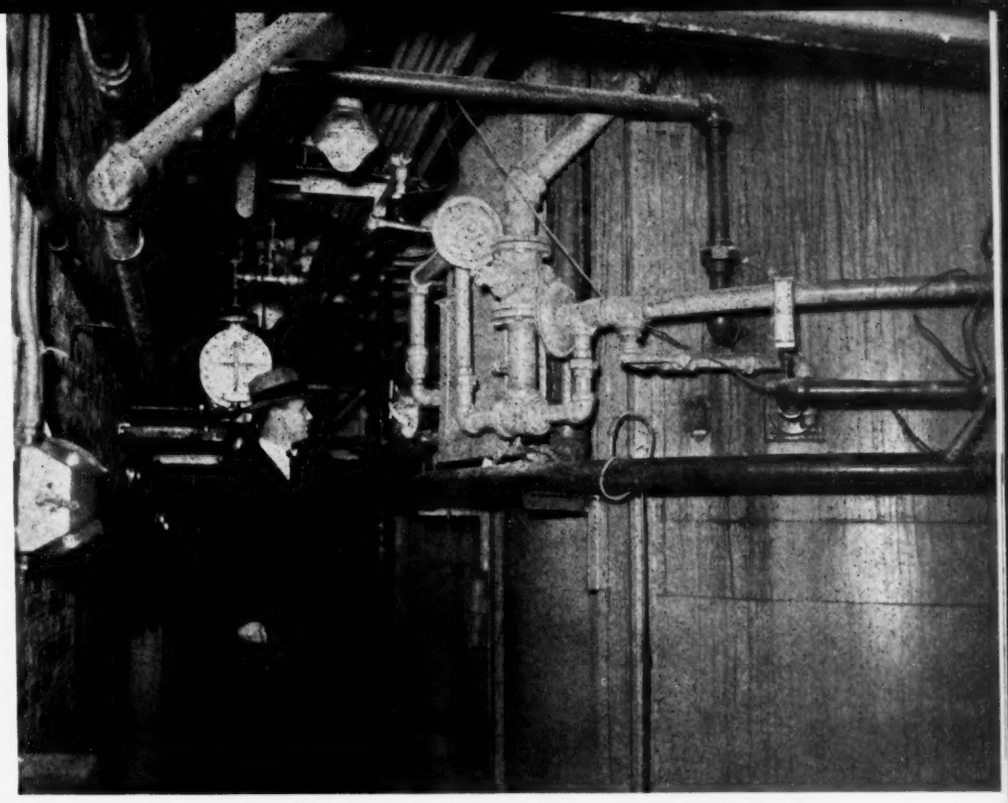
At the Mississippi River plant in Monsanto, Illinois, natural gas heats the furnaces and the kettles shown at the bottom of this page, which are used in the manufacture of chlorinated diphenols (aroclors), as well as the fusion furnaces of the phenol department. New units at this plant, now nearing completion, for the manufacture of certain phosphates will also employ this source of heat.

### Specific Advantages

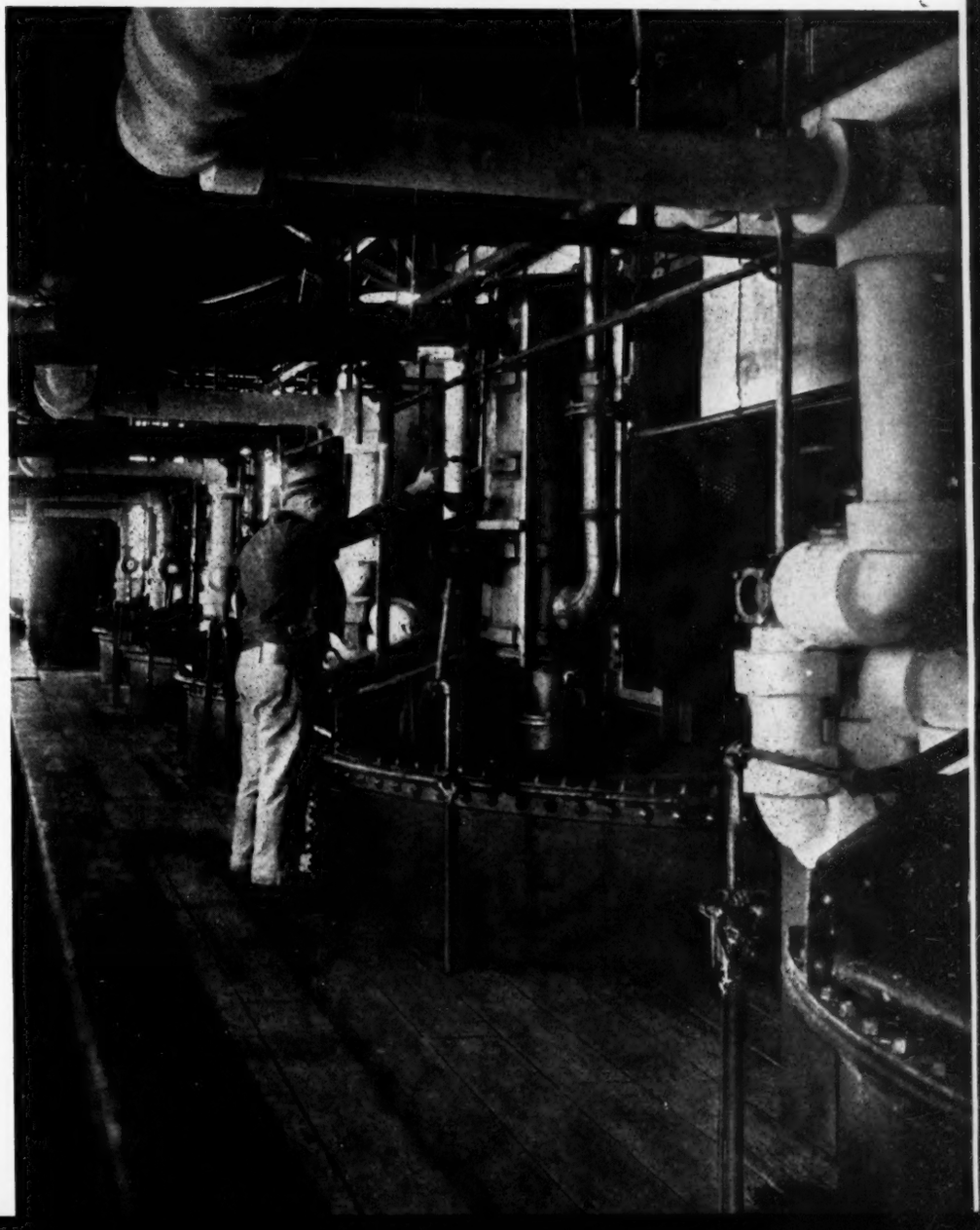
At the Anniston, Alabama plant, natural gas is used for the conversion of diphenyl, for tempering abrasives, for the dehydration of sodium and calcium phosphates, and for process steam. The plant superintendent cites three specific advantages gas affords over other fuels: cleanliness, as necessitated for phosphates of food grade requirement; economy; and lower handling and maintenance costs.

### Control a Monsanto Habit

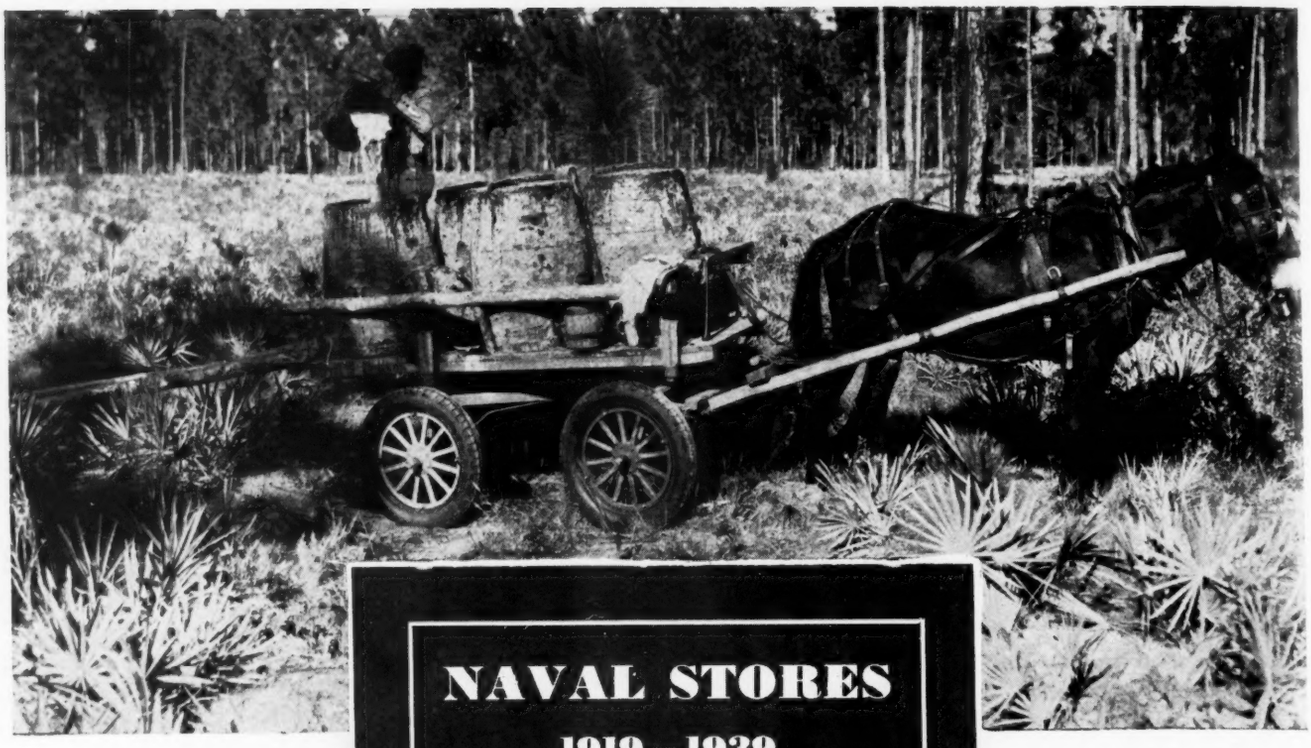
The precise control of process temperatures, exemplified by the gas-fueling practices here noted, carries throughout the entire Monsanto organization—with its ten strategically located U. S. plants and its two foreign headquarters. In each and every plant studies are made to determine just what fuel practice is best suited for each particular manufacturing operation.



**View of the phthalic anhydride unit at the Everett, Mass., plan of Monsanto. The superintendent is shown standing before the port through which exactly-controlled air-gas mixtures are conducted to the burners in the unit chamber. Note relatively simple control.**



**Natural gas heats these kettles used in the manufacture of chlorinated diphenols at the modern Monsanto plant at Monsanto, Ill.**



# NAVAL STORES
## 1919—1939

*By Dr. Eldon Van Romaine*

DURING the past 20 years many new uses for rosin and/or rosin products have been developed and, while the annual requirements for most of these products, as yet, are not large, one—synthetic resins—has grown rapidly during the past ten years and is now a very important use for rosin. Some of the other uses for rosin which may be of interest are—linoleum, asphalt emulsions, shoe bottom fillers and box toes, core oils and dry core binders, sticky fly paper, rubber adhesive cements, matches and disinfectants.

Turpentine, on the other hand, enjoys a relatively small number of uses of which there is but little diversification. When it was first recovered from the crude gum, it was used as an illuminating oil and a solvent. Its use for the former purpose was discontinued many years ago, but it is still used as a solvent, principally in paint, varnish and shoe polish. The annual requirements for these uses are equal to approximately 90 per cent. of the total annual consumption. There are but two strictly chemical uses for turpentine, one of which is the conversion to terpin hydrate and terpineol and the other is synthetic camphor. The world's requirements for the latter use in 1938 were estimated to be about 74,500 barrels (50 U. S. gals.) or approximately 7.0 per cent. of the total world production for that year.

In 1921, the U. S. Department of Agriculture, Bureau of Chemistry and Soils, began a systematic survey of the principal turpentine and rosin consuming industries in this country and since that year, the Bureau has issued annual reports which show the amount of each of these products which was consumed by the different industries during the year.

The difference between the total U. S. consumption and the industrial consumption of turpentine represents the approximate amount which was used each year by the paint contractors, individual painters and property owners.

The United States imports a comparatively small amount of turpentine and rosin each year. The volume of turpentine imported has steadily increased during the period 1918 to 1938, whereas the imports of rosin, from time to time, have varied considerably.

The naval stores industry, as it is constituted today in this country, consists of four separate divisions distinguished from one another by either the general process employed or the source of raw material. These

***DR. Eldon Van Romaine, technical director of the General Naval Stores Division of Newport Industries, in the concluding installment of his detailed study of the history and development of our naval stores industry, discusses the methods employed by the gum rosin and gum turpentine producers, relates the early difficulties of the wood rosin industry, reviews present-day scientific methods and indicates a number of new and promising chemicals now available. Intensive research has revivified an old important American industry, and given new hope to the South.***

divisions are known as the steam and solvent wood naval stores industry (frequently referred to as steam distilled wood naval stores), gum naval stores industry, destructively distilled wood naval stores industry and the steam distilled wood sulfate industry.

**Approximate Annual United States Imports of Rosin and Turpentine 1918-19 to 1937-38 Incl.**

| | *Rosin* *Bbls.* *(500 lbs.)* | *Turpentine* *Bbls.* *(50 U. S. Gallons)* |
|---|---|---|
| 1937-38 | 336 | 14,335 |
| 1936-37 | 2,418 | 15,929 |
| 1935-36 | 2,236 | 12,490 |
| 1934-35 | 2,526 | 10,559 |
| 1933-34 | 3,936 | 10,007 |
| 1932-33 | 1 | 9,070 |
| 1931-32 | 750 | 6,440 |
| 1930-31 | 906 | 7,931 |
| 1929-30 | 2,815 | 6,400 |
| 1928-29 | 4,122 | 6,860 |
| 1927-28 | 3,625 | 6,527 |
| 1926-27 | 22,767 | 6,132 |
| 1925-26 | 17,068 | 5,748 |
| 1924-25 | 1,574 | 3,554 |
| 1923-24 | 2,358 | 3,128 |
| 1922-23 | 1,668 | 2,374 |
| 1921-22 | 978 | 1,621 |
| 1920-21 | 288 | 868 |
| 1919-20 | 192 | 33 |
| 1918-19 | 420 | 6 |

The first naval stores products of importance and volume were made by the destructive distillation of the wood. The gum naval stores industry was established about 1800. The first steam and solvent products were produced about 1905 and the steam distilled wood sulfate division began to produce turpentine about 1915-1917.

### Original Wood Distillation Method

The original wood distillation, generally called tar burning in the olden days, was a very crude operation. The wood was distilled in sod pits or kilns and only the tar and pitch were recovered. Later, iron retorts and iron and concrete kilns were developed and used. The first plant to employ the basic principles of the present day destructive distillation process, using the waste pine wood as its raw material, was erected by James Stanley at Wilmington, N. C., in 1872. By 1900 the industry had become quite well established and shortly thereafter, it assumed a position of considerable importance, particularly as a supplier of valuable raw materials recovered from the stumps and top wood obtained from the vast areas of pine cutover land. Large plants were erected at Jacksonville, Pensacola, New Orleans and Fayetteville, N. C. A number of smaller plants were built in the Carolinas, Alabama and Georgia, (but these are no longer operated and most of them have been dismantled).

In principle the process now differs but little from the one used by Stanley. However, throughout the years some changes in retort and kiln design, as well as many important improvements in the refining operations, have been made. The products have been steadily improved and the process is operated under careful scientific control. The general process consists in cutting the stump and top wood in proper lengths and then placing it into the retorts or kilns, which are equipped with condensers, where it is heated to the charring point either by direct fire or hot gases, which are distributed uniformly throughout the kiln or retort by means of iron pipes. As the distillation progresses, the pitch or tar is drawn from the bottom of the kiln and the distillate, which consists of an oil and pyroligneous acid, is led into vats or tanks where these products are allowed to separate from one another by gravity. After separation, the oil and the pyroligneous acid are subjected to further treatment whereby pine tar, tar oils, pine oil, turpentine and pine wood naphtha are obtained from the oil, and from the pyroligneous acid wood alcohol and acetate of lime are obtained. These materials are then further refined to meet the consumers' various conditions.

The products of this industry at the present time are: charcoal, pine wood naphtha, commercial dipentene, several different types of pine tar, pine tar oil and pitch, pine creosote oil, pyroligneous acid, a variety of rosin oils, wood alcohol, destructively distilled pine oil and turpentine. There are also a number of very special products made by the individual companies.

Some of the uses for this industry's products are—printing ink, paint, varnish, lacquer, disinfectants, insecticides, fungicides, rubber reclaiming and compounding, brewers pitch, cordage, impregnation of piling and railroad ties, shingle stains, pharmaceuticals, grease and other petroleum compounding, activated charcoal, chicken feed and road construction.

The following is the estimated production of destructively distilled turpentine for each year during the period 1923 to 1937 inclusive:

| *Year* | *Bbls.* *(50 U. S. Gallons)* |
|---|---|
| 1937 | 6200 |
| 1936 | 6750 |
| 1935 | 6500 |
| 1934 | 5300 |
| 1933 | 5500 |
| 1932 | 4950 |
| 1931 | 5600 |
| 1930 | 5250 |
| 1929 | 6773 |
| 1928 | 7500 |
| 1927 | 6520 |
| 1926 | 6900 |
| 1925 | 5000 |
| 1924 | 3675 |
| 1923 | 3350 |

Information relative to the production for the years 1918-1923 is not available.

The gum division of the naval stores industry was the first to produce turpentine and rosin and it uses, as its raw material, the crude gum obtained from the living tree. The first step in the operation is the tapping or chipping of the tree. This consists of fastening the cup and apron or gutters to the tree and cutting the first groove or streak in the tree trunk just above them. The streak is cut at an angle from left to right and right

A gum rosin-turpentine "plant." Usually termed "still."

View of the distillation chambers.

View of the rosin trough.

A gum rosin cooperage shop.

to left, V shape, and is ½ to ¾ inch wide, about ½ inch deep and from 6 to 10 inches long, depending on the diameter of the tree. A fresh streak is cut about every week or ten days throughout the season, which is usually from April to and including October. The lower edge of the second and succeeding streaks merge into the previous streak and in this way a more or less even chipped surface is obtained. This is called a face. As the gum exudes from the fresh wound, it flows down the face where it is led into the cup by the gutters or apron. The gum is collected every three to four weeks and transported to the still where it is subjected to a steam distillation.

In the distillation, the turpentine and water vapors pass out of the top of the still into a condenser and the condensate is led into wooden vats where the turpentine and water separate from one another. The rosin, which remains in the still as a residue, is drawn from the still in a molten condition, usually through copper wire screens and cotton, into drums, barrels or other suitable packages. The turpentine and rosin produced in this way is known as gum spirits of turpentine and gum rosin.

The average composition of the crude gum as it is received at the still is approximately: Rosin, 68 per cent.; turpentine, 20 per cent.; water, 12 per cent.

When gum rosin and turpentine were first produced, the tapping of the tree consisted in chipping and streaking in much the same manner as is practiced today. The streaks, however, were somewhat wider and deeper and the gum was collected in large holes which were chopped into the trunk of the tree directly under the area which was to be chipped. These holes were called boxes.

### Efforts of Charles H. Herty

In 1901 the United States Department of Agriculture, Bureau of Forestry, under the direction of the late Dr. Charles H. Herty began conducting experiments along the lines of the French System of tapping the tree. These experiments were carried out over a period of four years and they resulted in the successful introduction of the present system, which is called the cup and gutter or cup and apron system.

When pitch was the principal product made from the crude gum, the gum was heated in an open kettle and cooked down, as it was called, to a thick pitch. In some instances, the kettles were covered with sheep skins upon which some of the vapors would condense and the wool would become saturated with oil. The oil was recovered by wringing out the fleeces. As the demand for turpentine, as a solvent and for illuminating purposes, increased it became necessary to obtain a higher yield of turpentine per unit of gum. This brought about the use of iron retorts and condensers and in 1834, the copper pot still and worm condenser were introduced. This equipment, with some modifica-

tion in design, is still used by the majority of the producers.

In general, the distillation is conducted by placing the gum into the still and gradually raising the temperature, usually by direct fire, to the boiling point. The crude gum contains some water, about 12 per cent., and therefore no further quantity is required during the first part of the distillation. However, as the distillation progresses it becomes necessary to add more water and this is usually done by introducing it into the still in a continuous stream at a rate more or less comparable to the rate at which it distills.

Originally, and for many years, the universally practiced method for controlling the distillation and determining the temperature within the still was based on certain sounds which emanated from the end of the condenser. This method was known as the "Sound" method and is still employed by many of the smaller producers. In 1907, Dr. Stephen Neal introduced the "thermometer" method.

### Little Progress in 100 Years

For over 100 years very little scientific progress was made by the gum division of the naval stores industry, but this cannot be said about the last 20 or 25 years, for during this period a number of important developments of a fundamental and scientific nature have come to pass. The box system of tapping the trees has virtually become extinct. Reforestation is now on a scientific basis in many states. Greatly improved scientific methods of handling and distilling the crude gum, which were developed in the laboratories of the Bureau of Chemistry & Soils, Department of Agriculture, Washington, D. C., and worked out on a commercial scale at the Bureau's Naval Stores Research Station at Olustee, Fla., have been adopted by many of the larger producers. Perhaps the most important single development from a chemical viewpoint which has taken place in the gum turpentine and rosin industry in recent years has been the building of two large gum purification and distilling plants at Jacksonville, and Valdosta, Ga. These two centralized operations offer the first real opportunity in the gum division of the naval stores industry in this country for careful laboratory control of the process and chemical research. The operation is based on the Cline process* for purifying the gum, and in general consists in first grading the crude gum, then filtering it through presses of special design. The filtration removes all of the extraneous matter, as leaves, wood chips, dirt, etc. The filtered or purified gum may be sold or the rosin and turpentine recovered by distillation, which is conducted by evacuating the still to the desired pressure and then permitting the filtered gum to be drawn slowly into the still until a suitable charge is obtained. At this point the flow of gum is cut off and the vacuum distillation is continued until prac-

*U. S. Patent No. 1,945,421.

tically all of the turpentine has been recovered. Steam is then introduced and the distillation is completed as a steam-vacuum distillation.

The gum division of the naval stores industry consists of approximately 1,500 producers, most of whom operate on rented or leased timber. The terms of a turpentine lease cover the working of a specified number of cups at a certain rented fee per crop per year. A crop consists of 10,000 cups or faces and will yield, under normal conditions, an average of approximately 36 barrels (50 U. S. gals.) of turpentine and 120 barrels (500 lbs.) of rosin per season or about 6.5 pounds of turpentine and rosin per cup. The products manufactured by this industry are—the 13 color grades of rosin, "B" to "X" inclusive, turpentine and purified gum.

## Utilization of Old Pine Stumps

Owing to what seemed to be an ever increasing demand for turpentine and rosin and the rate at which the pine tree was being depleted by the naval stores and lumber industries, many turned their attention to the recovery of turpentine and rosin from the old pine stumps and top wood, of which there was a plentiful supply. In about 1905, George Walker[1] began experimenting on the recovery of the volatile oils and rosin from the light wood. Sometime later he built a plant at Conway, S. C., in which he produced about 200 barrels of rosin per week and a considerable quantity of turpentine. In 1908, Homer T. Yaryan began experimenting along the same lines as those of Walker and in 1909 he and his associates erected a plant at Gulfport, Miss., which in the first year of its operation, 1910-11, produced 14,300 barrels (500 lbs.) of rosin, 1,700 barrels (50 U. S. gals.) of turpentine and 85,000 gallons of pine oil. In principle the Walker process and that of Yaryan[2] were the same, that is, the wood was ground in a mill known as a hog, and then packed into retorts or extractors where the volatile oils were recovered by steam distillation and the rosin extracted with a solvent. Thus, a new naval stores industry, known as the steam and solvent naval stores industry, was born, and was destined to become a most important factor in the chemical development of the turpentine and rosin industry.

As might be expected, the growth and expansion of the industry in the first ten years of its existence was relatively slow and the production was quite irregular, but since the year 1921-22, with the exception of the years 1930-31 to 1932-33 inclusive the production has steadily increased each year and in 1937-38 the amount of steam distilled wood turpentine and rosin produced was equal to 21 per cent. and 31 per cent. respectively of the total domestic production of gum and steam distilled wood products.

When this industry came into being, a new naval stores product consisting primarily of tertiary terpene alcohols—as alpha terpineol and a mixture of other terpineols, secondary terpene alcohols, fenchol and borneol, a small amount of phenol ether, methyl chavicol and a few per cent. of the terpene hydrocarbonx, terpinene and terpinolene, was introduced to the world. This product was called "steam distilled pine oil" and its development has been an extremely interesting experience. Among its many, well diversified uses, which are based on some one or more of its physical and/or chemical characteristics, are such important uses as, a wetting, dispersing and emulsifying agent in a number of the different branches of the textile industry, as a flotation agent in the mining industry, principally copper, but a number of other minerals as well, as a disinfectant in the disinfectant and insecticidal industry, as a defoaming agent in the manufacture of coated paper and in the chemical industry as a source of terpineol, borneol, anethol, fenchone and camphor.

**Production of Wood Rosin, Steam Distilled Wood Turpentine and Steam Distilled Pine Oil—1918-19 to 1937-38 Incl.**

| *Year* | *Rosin Bbls. (500 lbs.)* | *Turpentine Bbls. (50 U. S. gals.)* | *Pine Oil Bbls. (50 U. S. gals.)* |
|---|---|---|---|
| 1937-38 | 803,538 | 136,292 | 96,334 |
| 1936-37 | 724,028 | 122,388 | 95,429 |
| 1935-36 | 575,292 | 88,875 | 83,594 |
| 1934-35 | 509,108 | 80,083 | 73,440 |
| 1933-34 | 486,888 | 78,760 | 62,608 |
| 1932-33 | 355,923 | 58,293 | 47,954 |
| 1931-32 | 313,725 | 51,068 | 41,994 |
| 1930-31 | 438,917 | 76,366 | 53,794 |
| 1929-30 | 466,787 | 85,736 | 56,678 |
| 1928-29 | 431,654 | 77,896 | 53,542 |
| 1927-28 | 409,474 | 76,948 | 55,681 |
| 1926-27 | 365,480 | 70,298 | 52,154 |
| 1925-26 | 284,504 | 58,643 | 37,258 |
| 1924-25 | 257,531 | 57,025 | 36,615 |
| 1923-24 | 201,700 | 43,400 | 22,595 |
| 1922-23 | 166,146 | 33,473 | 18,805 |
| 1921-22 | 51,897 | 8,686 | 5,676 |
| 1920-21 | 89,334 | 15,961 | 9,215 |
| 1919-20 | 114,957 | 20,838 | 10,358 |
| 1918-19 | 110,182 | 19,353 | 9,224 |

The process which was used for many years by the companies in this industry for recovering the resinous materials and oils from the wood was in principle the same as that originally used by Walker and Yaryan. Some of the companies have in recent years modified the procedure by eliminating the step of steaming the wood before extracting with a solvent. This has been made possible through the use of special petroleum solvents which have been developed. Certain coal tar solvents, such as benzol, may also be used.

## Description of Existing Process

In general, the process consists of collecting the stump and top wood and shipping it to the plant where it is prepared for processing by first hogging and then shredding. The shredded wood is then packed into retorts or extractors where it is either steamed and then extracted or extracted without prior steaming. Where the step of steaming is involved, either saturated or superheated steam is introduced in the bottom of the retort, the steam and oil vapors pass out at the top into

condensers and the condensate is led into tanks where the oils and water are separated. The major portion of the oils are removed from the wood in this step. After steaming the rosin and the balance of the oils are extracted from the wood with a volatile solvent.

The oils obtained in the steaming operation, called "crude turpentine," are fractionated into three principal fractions, turpentine, intermediates and pine oil. The hot rosin extract obtained in the extraction step, which consists of rosin, solvent and pine oil, is pumped from the extractors into tanks where it is given a preliminary refinement, after which the rosin and pine oil are recovered by either dry vacuum distillation, steam distillation or a combination of the two. The rosin thus obtained is the natural wood rosin of "FF" color grade.

When the wood is treated directly with a solvent, that is without prior steaming, the extract contains all of the oils and the rosin. The extract is given a preliminary refinement and then it is subjected to fractional distillation, whereby several fractions are obtained and the rosin, natural "FF," is recovered as in the steaming and extraction procedure. The various oil fractions are subjected to further treatment and the refined turpentine and pine oil are obtained from them.

The natural rosin as it is extracted from the wood is entirely suitable for many uses and as such it is sold in large quantities. However, two of the companies in the industry, namely Newport Industries, Inc., and Hercules Powder Company, use the major portion of their production of this rosin as an intermediate for the manufacture of a variety of special types of "FF" color grades of rosin and the light colored wood rosins.

### Wood Rosin by Two Methods

The medium and pale grades of wood rosin are being made today by two different processes. One is based on the decolorizing action of Fuller's earth and the other is based on the selective solvent principle and employs furfural as the solvent for the color bodies.

The first step in the two processes is about the same, that is, the hot natural "FF" rosin is dissolved in a suitable petroleum solvent at a rosin concentration of from 15 to 20 per cent. by weight. The solution is then cooled, washed with water and the water allowed to settle out. In the second and succeeding steps the two processes differ materially. In the earth process, the washed rosin solution is passed through the earth filters at a given rate of flow, which is more or less dependent upon the desired color grade of the finished rosin, and the rosin is then recovered from the filtered solution by evaporating the solvent which is returned to the system and reused. In addition to the color bodies, the earth removes from the original rosin certain resinous materials and these are recovered as a dark resin in the earth revivifying operation, which consists in treating the earth with a hot alcohol-petroleum naphtha solution. After the solvent mixture has been used for revivifying the earth, it is subjected to fractional distillation whereby the alcohol, naphtha and resinous materials are recovered. The yield of decolorized rosin varies somewhat depending on the color grade of rosin produced.

In the furfural method the washed naphtha "FF" rosin solution is mixed with a given amount of furfural and the mixture is then heated to about 115°F. At this temperature a homogeneous solution is obtained. After a certain period the mass is cooled to about 10°F., when the furfural, containing the color bodies and certain resinous materials extracted from the original "FF" rosin, separates from the naphtha rosin solution. The purified rosin is then recovered by evaporation of the solvent. The furfural containing the impurities is subjected to a distillation, whereby the furfural is distilled off, leaving a dark resinous material as a residue.

### Expansion Since 1927

In the early years of the existence of the steam and solvent wood naval stores industry the companies engaged in this business concentrated their efforts on process problems, markets for the products they were then producing, etc. Growth and expansion, therefore, was limited but during the past 20 years, particularly since 1927, this industry has witnessed a most active period of development and expansion. This is evidenced by the large increase in production and in the number and variety of products which have been developed since that year. Some of these products have opened up new fields for naval stores and others, because of their special properties, have more firmly consolidated the use of naval stores in some of the older fields.

### Originally Only Three Products

Originally and until about 1920, but three products were produced, namely, natural "FF" rosin, turpentine and one type of pine oil. Shortly after that year, two lime treated types of "FF" rosin were produced. In about 1922 anhydrous water white pine oil put in its appearance. During 1924 to 1927 several special solvents were developed and in 1926 the first heat treated wood rosin, "FF" color, was offered. In 1927 three additional types of rosin, a modified heat treated, a soda treated and a new lime treated, all of "FF" color grade, were introduced and in 1928 the first pale wood rosin, "I" color, was produced in commercial quantities. Within a short time after 1928, wood rosin was being produced in all of the color grades known to gum rosin and in addition to the so-called natural types, a variety of special types in most of the color grades were also being manufactured. Since 1930 the expansion of the industry in the development and production of special and new materials marks an epochal period in the history of the industry in this regard and such products as ethyl and methyl abietate, zinc resinates, terpene maleic anhydride resins, solvents and pine oils of vari-

ADVERTISING PAGES REMOVED

ous types or grades, hydrogenated rosin, fenchone, terpineol, anethol, camphor and paracymene have been added to already mounting, previously expanded list of steam and solvent wood naval stores products. The number of products, including the many varieties of rosin, of which there are about 50, that are now being produced by the industry approximates 100, and the number of companies engaged in this business is 10. The wood treating capacity of these companies is about 3,100 tons per day.

While sulfate wood turpentine has been produced in Norway and Sweden for 30 years or more and talloel, (tall-oil) a mixture consisting of approximately 41 per cent. of rosin acids and 59 per cent. of fatty acids, has been made in Sweden for about 25 years, neither product, however, was produced in quantity in the United States prior to 1918. The sulfate wood naval stores division is, therefore, the youngest of the American naval stores family.

### Early Progress Very Slow

The producers of these materials have had some extremely difficult refining problems to solve and progress was relatively slow in the beginning but in recent years, the production, particularly that of turpentine, has increased considerably and it is rapidly becoming an important factor in the naval stores business.

It appears that reliable data pertaining to the annual production of sulfate wood turpentine during the early period of its manufacture is not available, but it is believed, however, that for several years prior to 1930 the production averaged from 4,000 to 5,000 barrels (50 U. S. gals.). Since 1930, the U. S. Department of Agriculture, Bureau of Chemistry and Soils, have included the production of this product in their annual naval stores report. This data is quoted below.

**Production of Sulfate Wood Turpentine in the U. S. For the Years 1929-30 to 1937-38**

| *Year* | *Bbls. (50 U. S. gals.)* |
|---|---|
| 1937-38 | 38,500 |
| 1936-37 | 22,635 |
| 1935-36 | 11,712 |
| 1934-35 | 9,832 |
| 1933-34 | 9,000 |
| 1932-33 | 8,000 |
| 1931-32 | 12,248 |
| 1930-31 | 9,957 |
| 1929-30 | 4,000 |

Sulfate wood turpentine is recovered from the pine wood in the sulfate pulp cooking operation by condensing the vapors as they are periodically emitted from the top of the digesters. The crude material is then refined usually by chemical treatment and distillation. The yield is primarily dependent upon the type of wood processed and the ratio of heart wood to sap wood. It has been estimated that the average yield obtained by the pulp mills in the south is approximately 1.65 gallons per ton of pulp.

The black liquor from the sulfate pulping process contains, among other materials, a mixture of rosin and fatty acid soaps. The mixed soaps are recovered from the black liquor and the free acids regenerated by the treatment with a mineral acid. The mixture of rosin acids and fatty acids thus obtained is called "talloil," sometimes referred to as liquid rosin, and is, in general, sold as such.

A considerable amount of research and experimental work is being conducted on the commercial separation of the two groups of acids and while at least one manufacturer has succeeded in producing a fairly good grade of abietic acid, the production as yet is not large.

The principal use for talloil at present is as an emulsifying agent in disinfectants and asphalt road emulsions. For this use it must first be neutralized with caustic soda or potassium. As is the case with sulfate turpentine the yield of talloil depends to a great extent on the type of wood treated. It is estimated, however, that the total amount of the mixed acids which can be recovered will average about 135 pounds per ton of pulp produced.

The products of the sulfate, steam and solvent and destructively distilled wood divisions of the naval stores industry, unlike gum turpentine and rosin, are marketed direct by the individual companies engaged in their manufacture.

### Industry on a Sounder Basis

In summing up the various developments which have taken place during the past 20 years, it is evident that the naval stores industry in this country, as a whole, has undergone a number of important changes and it is now in a much better position to expand on a fundamental and scientific basis than it has been at any other time in its history. While it is true that the steam and solvent division has made a great deal more progress than the other divisions in regard to research, and the development and diversification of its products, nevertheless certain fundamental developments have taken place in the gum division, such as reforestation, establishment of the Research and Experimental Station of the U. S. Department of Agriculture, Bureau of Chemistry & Soils and, to a somewhat limited extent, the centralization of gum distillation. These are of prime importance and they mark a period of advancement along permanent and scientific lines. The years 1918-19 to 1937-38 may be considered as the transition period of the naval stores industry in America.

For a great deal of the statistical data, historical facts and certain other information contained in this article, acknowledgment is made to: Gamble's Naval Stores Year Book; Mr. Thomas Gamble; Mr. E. W. Colledge; Mr. G. A. Hawkins; Mr. J. E. Lockwood; Mr. T. W. Delahanty.

[1] A paper on the "Methods for the Utilization of Wood Waste" by George Walker. Read at the meeting of the New York Section of the Society of Chemical Industry on May 19, 1911.

[2] U. S. Patent No. 915,400—May 16, 1909.
U. S. Patent No. 992,325—May 16, 1911.

# "Headliners" In the News

Howard B. Brown, Philadelphia, who has been named secretary of Pittsburgh Plate Glass, succeeding the late Carl S. Lamb.

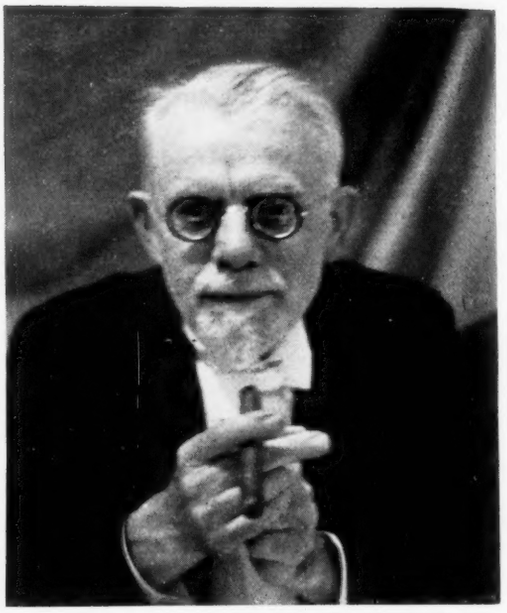
Below, Charles McDonough, advertising manager, Combustion Engineering, N. Y. City, was recently elected president of the National Industrial Advertisers Association.

Above, George V. Doerr, vice-president and director of McKesson & Robbins, Inc., was elected president of the National Wholesale Druggists' Association at its 65th annual meeting recently. Right, John Lyon Collyer who has been elected president of the B. F. Goodrich Co.

Four of the five living scientists who have won the Acheson medal bestowed by the Electrochemical Society, are here grouped in one picture. Three were congratulating Dr. Francis C. Frary (holding medal), director of Aluminum Company of America research laboratories and newest winner. Left to right: Dr. Colin G. Fink, Dr. Frank J. Tone, Dr. Frary and Dr. Frederick M. Beckett.

# The A. C. S. Boston

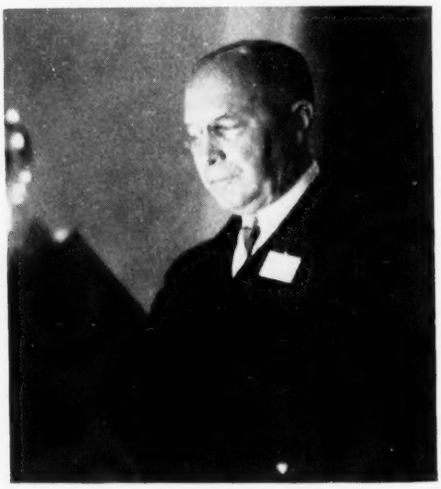
Highlight of the recent A. C. S. Boston Meeting was the banquet celebrating the centenary of Goodyear's discovery of the method of vulcanizing rubber. Left to right, John M. Bierer, toastmaster; Dr. J. B. Conant, president of Harvard; and Dr. Karl T. Compton, M. I. T. president.



Genial A. C. S. president, Dr. Charles A. Kraus, Brown University, posed for the candid camera.

Another speaker at the Goodyear dinner—P. W. Litchfield, president of Goodyear Tire & Rubber.

A. C. S. treasurer, Robert T. Baldwin.

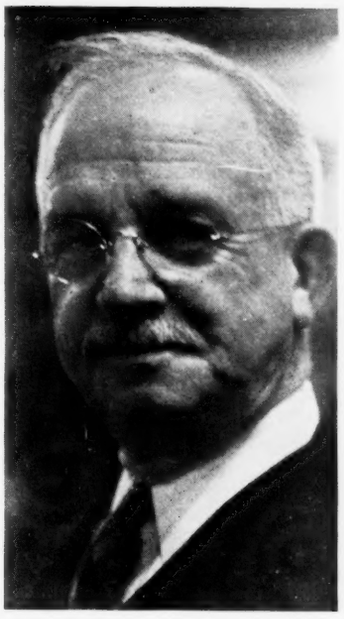


Dr. Robert E. Swain of Stanford University.

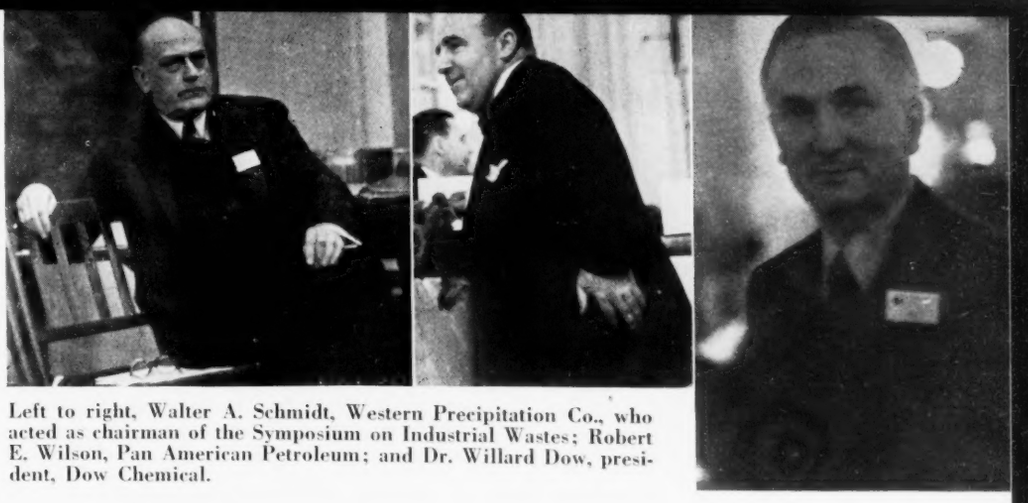
Left, Harold C. Chapin, Lowell Textile Institute; Edward Bartow, State Univ. of Iowa.

Left to right, Dr. Gustav Egloff, Universal Oil Products; Dr. Harrison E. Howe, editor of I. & E. C.; Dr. Harry G. Lindwall, N. Y. U.; and George F. Rugar, Hooker Electrochemical. Registration at the meeting reached the 4,000 mark.

# "Tea Party"



Dr. Charles L. Parsons, secretary of the A. C. S.



Left to right, Walter A. Schmidt, Western Precipitation Co., who acted as chairman of the Symposium on Industrial Wastes; Robert E. Wilson, Pan American Petroleum; and Dr. Willard Dow, president, Dow Chemical.

Dr. Per. K. Frolich, Standard Oil Development Co.

Above, Anthony Anable, The Dorr Co.

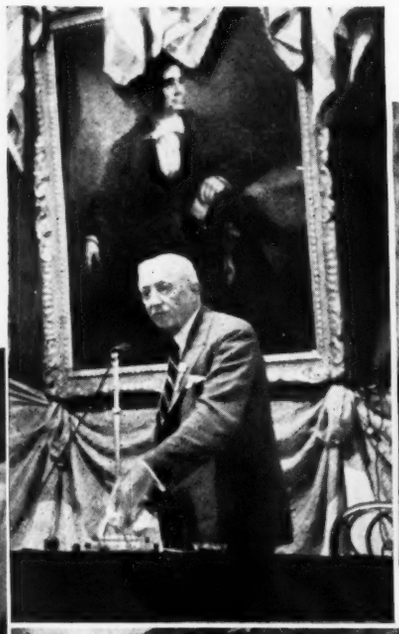
Below, S. D. Douglas, Carbide & Carbon Chemicals Corp.

Dr. Ernest D. Wilson, Zialite Corp.

Left to right, James G. Park, Standard Alcohol; Ivan F. Harlow, Dow Chemical. Latter's paper on waste disposal was outstanding.

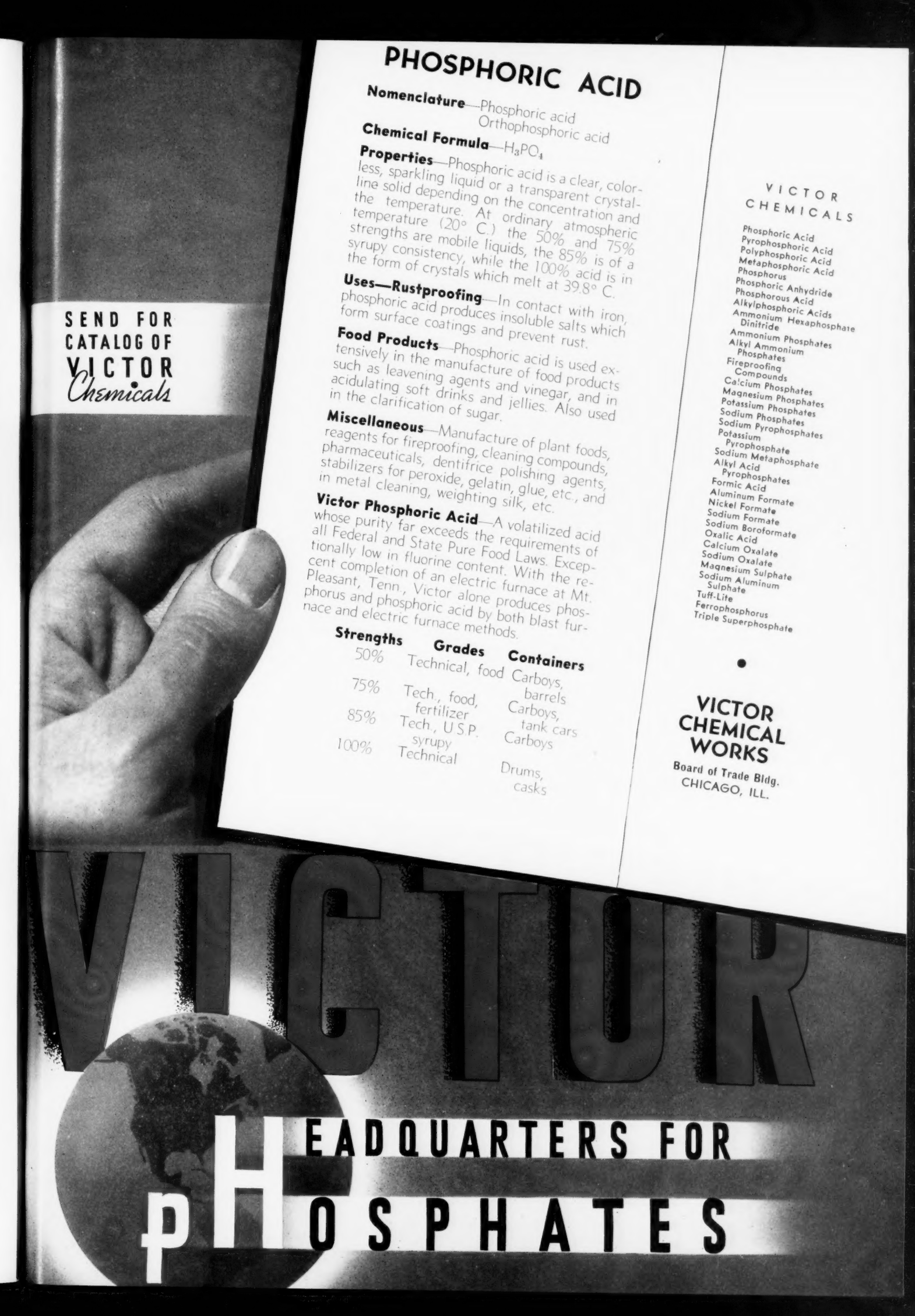
Dr. M. A. Mohlman, director of laboratories, Chicago Sanitary District.

# Textile Chemists at Boston



Left, Alban Eavenson, president of the A. A. T. C. & C. and connected with Eavenson & Levering, Camden, N. J.; below, Dr. E. H. Killheffer, Du Pont, and Dr. Harold C. Chapin, Lowell Textile Institute.

Above, Henry H. Nelson, research chemist with The Sharples Solvents Corp.; right, H. L. Siever, southern representative, Borne, Scrysmer Co., manufacturers of textile specialties, and E. H. Schmidt, chief chemist of the same company; below, right, Dr. Harold Smith, A. M. Tenney Associates. Directly below, a view of the "lighter side" of the convention.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Dinitride
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Calcium Phosphates
Magnesium Phosphates
Potassium Phosphates
Sodium Phosphates
Sodium Pyrophosphates
Potassium Pyrophosphate
Sodium Metaphosphate
Alkyl Acid Pyrophosphates
Formic Acid
Aluminum Formate
Nickel Formate
Sodium Formate
Sodium Boroformate
Oxalic Acid
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Solid, Ground, Flake

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Solid, Ground, Flake

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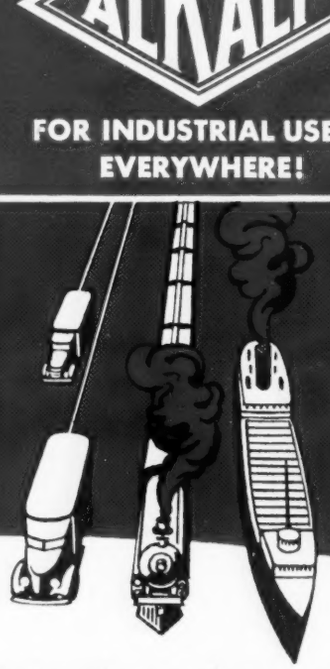
Potassium Chromate

Potassium Sodium Chromate

Chrome Salt Cake

Tanning Salts



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## What are the Sources of Scientific Information?

By T. E. R. Singer*

***RELATIVELY** few chemical companies maintain libraries and trained librarians equipped with knowledge of all of the varied sources of chemical and scientific data. To help the chemist and chemical engineer we asked Mr. T. E. R. Singer, for many years in charge of the chemistry room at the N. Y. Public Library and now a consulting chemical bibliographer, to review the most important sources of technical information.*

THE scientist acquires as part of his training a familiarity with the printed literature of his subject. Unfortunately the engineer, even the chemical engineer, does not so often display a similar knowledge. An attempt, only, can be made in a short article to include some of the most useful general books on chemical technology.

Of chemical technical dictionaries, undoubtedly the best known is Thorpe's Dictionary of Applied Chemistry. The most recent complete edition was published from 1921 to 1927, in seven volumes including an index. Three supplementary volumes were published from 1934 to 1936 and a new edition is in process of being published, three annual volumes to "Diffusion," having appeared so far. Incidentally the blue binding is dyed with the new Monastral blue dye. This tremendous work which can hardly be described in a few words, is not really a dictionary, but an encyclopedia consisting of a series of monographs by experts in their fields. A similar work in German only is Ullmann's encyclopedia in eleven volumes in the second edition published from 1928 to 1932. This encyclopedia is also arranged in the form of a series of monographs. Watt's four volume dictionary is also well known, but unfortunately the latest edition is only a reprint of an 1888 edition which was revised at that time by H. F. Morley and M. M. Pattison Muir. Smaller works are C. T. Kingzett's one volume encyclopedia, 5th edition of 1932, Hackh's Chemical Dictionary, 2nd edition with J. Grant, 1937, and the Chemical Age Dictionary and Couch's Dictionary of Chemical Terms, 1920, which are principally dictionaries of terms only, and the quite new chemical dictionary by H. Bennett, 1939. A useful one volume dictionary in French only is the one by Duval, while the Italians are taken care of by the illustrated two volume Giua and Giua-Lollini Dictionary published in parts from 1933 to 1934. A somewhat different dictionary is W. Gardner's Chemical Synonyms and Trade Names, published in England, the 4th edition, 1936 being a reprint of the previous edition, with an addendum of 140 pages.

Often it is desired to know the uses of a certain chemical together with a few particulars of characteristics, common trade names, shipping regulations, etc. The Condensed Chemical Dictionary, second edition (1930), and the *Oil Paint and Drug Reporter's* "Where you can sell" have together been replaced by Gregory's Use and Applications of Chemicals and related materials, which combines in many respects the features of both, besides being more up to date (1939). Two directories of suppliers of chemicals are well known in the U. S., *The Chemical Guide Book*, formerly published annually as a small separate volume by CHEMICAL INDUSTRIES, but now published each year as a separate supplementary issue to the October number, and the annual "Green Book" of the *Oil Paint and Drug Reporter*. One should also add the annual Chemical Engineering Catalog. Less well known are the "Weltadressbuch" in two volumes, in German of course, the first volume of which relates to German companies, the second to foreign (to Germany) companies. The chemical directory published by the well known English publisher of commercial directories, Kelly's, Ltd., relating to Great Britain and Ireland, also deserves to be more used. A directory not yet published, but which would be much used, would state the products which each chemical company makes, arranged by company and giving more information about the company itself than does, for instance, Moody's directory of corporations.

### Foreign Language English Dictionaries

Of foreign language English dictionaries, undoubtedly the best known are the German-English and French-English chemical dictionaries of A. M. Patterson, former editor of *Chemical Abstracts*, and well known authority on chemical nomenclature. The German-English dictionary was published in a second edition in 1935. A small two volume German-English and English-German chemical dictionary is that of Thurow, published in Germany, while Greeman has compiled a German-English dictionary of metallurgical terms. A very comprehensive dictionary has been compiled by A. W. Mayer and published in Germany by O. Spamer. Two volumes have appeared so far, volume one being German-English-French, and volume two English-German-French. A third volume on a French base is supposed to be published, also. These volumes are unfortunately very

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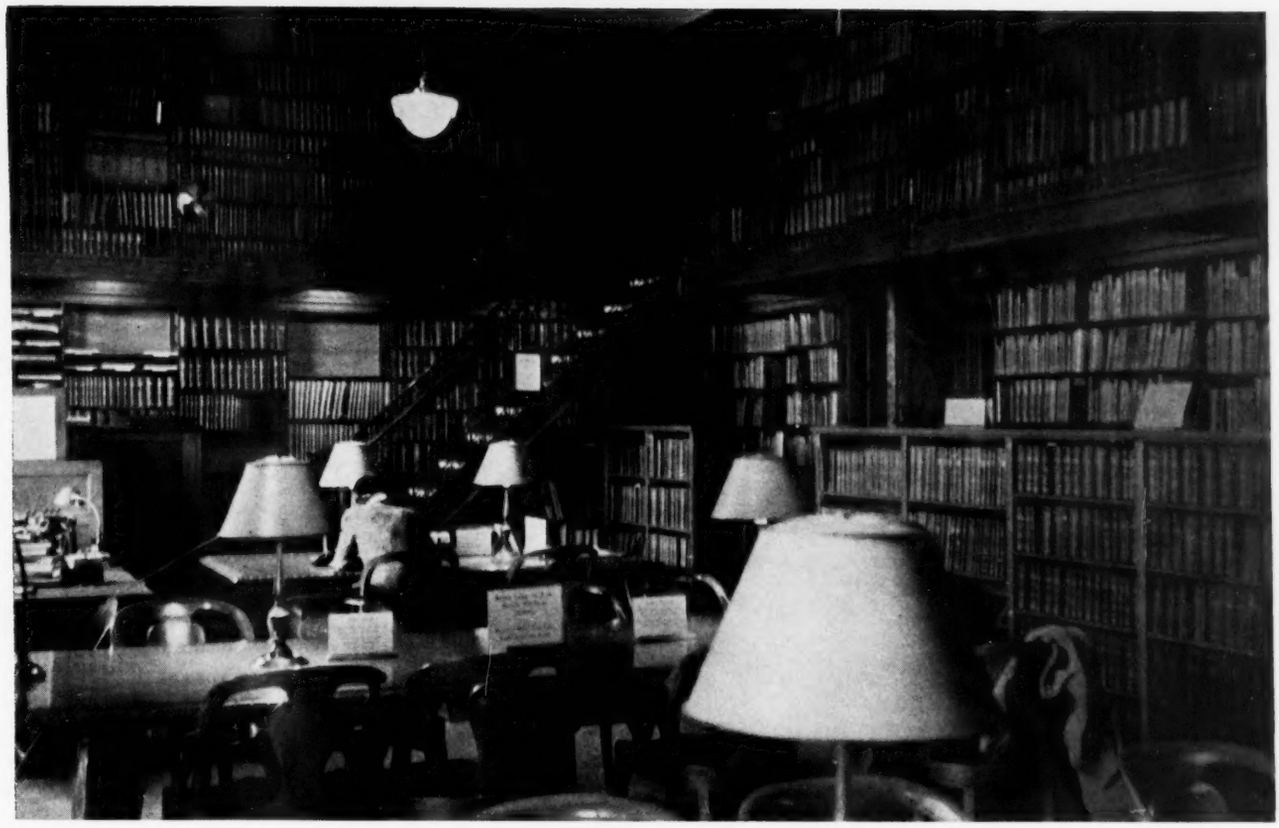

A Corner of the Chemistry Room of the New York Public Library.

expensive. Italian-English and Spanish-English chemical dictionaries are not yet known, but would be most useful.

Comprehensive tables of dyes, their composition, and references to the original literature are to be found in the "Colour Index" of the Society of Dyers and Colourists, together with its supplementary volume, and in the 7th edition of the "Farbestofftabellen" of Schultz who has recently brought out a second supplement bringing the dyes included as well as the literature references down to 1937. In the field of organic chemistry there is, of course, the tremendous work of Beilstein, in the fourth edition edited by Richter. A subject index to the now complete first half has been published in two parts as volume 28 of the whole work, while the second half is already under way. A less bulky, and also less comprehensive set is I. M. Heilbron's Dictionary of organic compounds in three volumes, which like Beilstein, includes references to the original literature, though naturally on a smaller scale. It is stated that this work is to be continuously revised and re-published without the addition of supplementary volumes. Inorganic chemistry is well supplied with comprehensive works, two in English, two in German and one in French being much used. Mellor's Comprehensive Treatise on Inorganic and Theoretical Chemistry was recently completed in 10 volumes, and Friend's text-book of inorganic chemistry has just been completed in 22 volumes. Both of these are English publications. Gmelin's Handbuch der anorganischen Chemie, 8th edition, and Abegg's work of the same title, are still being published, the former by the Deutsche Chemische Gesellschaft. Pascal and Baud, Traité de Chimie Minéra'e was published in 12 volumes from 1931 to 1934. All of these works, like the organic ones give a very large number of references to the original literature.

### Who's Who In Chemical Industry

Who's Who in Chemical Industry of which a second volume was recently published, as its name implies, relates to chemists. The membership list of the American Chemical Society last published in 1935, includes many non-industrial chemists, but its circulation and use is restricted. The American Institute of Chemists publishes a list of members from time to time in the *Chemist*, and the same applies to the membership list of the Electrochemical Society which appears in the Transactions of the Society. "American Men of Science" also lists many chemists. "Minerva," a German published, annual directory of the teaching staffs of universities in all countries naturally includes chemists also. A really comprehensive, freely available Who's Who of Chemists, foreign and American, is greatly needed. The American Institute of Chemical Engineers publishes a membership list.

### On Physical and Chemical Constants

Frequently wanted information relates to physical and chemical constants, such as boiling and melting points, vapor pressures, and the like. Three large sets on these subjects, again English, French and German, are the International Critical Tables, the Tables annuelles de constantes et donnees numeriques de chimie, de physique et de technologie, and Landolt-Bornstein physikalish-chemische Tabellen, 5th edition. Smaller volumes, perhaps more handy to use, are the Handbook of Chemistry and Physics, published annually, formerly edited by Hodgman and Lange but now by Hodgman alone. In 1934 Lange issued his own Handbook of Chemistry. A 2nd printing appeared in 1937 and a new edition has just been published. Other publications of this type are Van Nostrand's Chemical Annual which does not appear annually, and of which the last edition was the 7th issue, 1934. The Chemists Year Book, annually published in England, and the Chemiker Kalender, also annually published, in two volumes, in Germany, are foreign equivalents of this type of handbook. A somewhat different volume in a related field is the Chemical Engineers' Handbook, edited by J. H. Perry, and contains quite brief monographs on the various subjects it covers. This volume has only been published once, in 1934.

It may definitely be stated that the only simple way to keep up with chemical progress is by means of the abstract journals. With so rapidly changing a science as chemistry, books recording the state of knowledge are out of date almost as soon as they are published, but serve to record the state of the science

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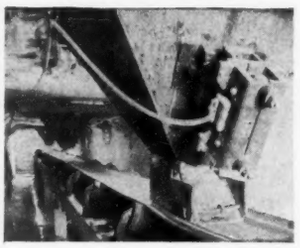

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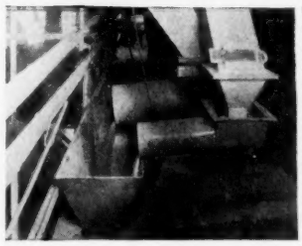

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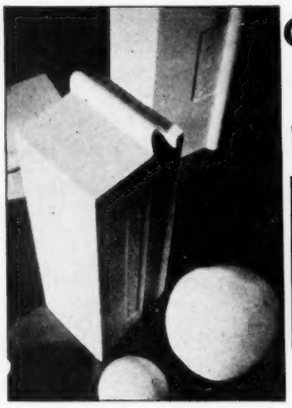

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up to the time of their publication. Books on methods and processes date less quickly, as changes cannot be made so suddenly. With the ever increasing number of chemical publications, and publications containing material of chemical interest, it is an impossibility for any one to read all the publications. For this reason the abstract journals, both all inclusive and the ones in special fields are followed instead. Fortunately, also, apart from the subject indexes of the abstracts, most of the abstract journals are classified by subjects in sections, so that even in the current issues particular subjects may be followed before the indexes are published.

### Importance of Chemical Abstracts

The best known abstract journal in the U. S. is of course the American Chemical Society's *Chemical Abstracts*. With its three decennial author and subject indexes, and its annual author, subject, formula and numerical patent indexes, it now abstracts more than 2800 periodicals, and forms an invaluable record from 1907 to date. *The British Chemical Abstracts*, while perhaps less all-encompassing, possess the advantage of going back, in one form or another, to the middle of the nineteenth century, through the earlier abstracts appearing in the *Chemical Society Journal*, London, and the *Society of Chemical Industry Journal*. They are more complicated to use than the American abstracts as they have always been divided into two or more separately-paged sections. Of recent years this complication has been increased rather than lessened, there now being four separately-paged parts with an attendant slowing-up in the process of using the one index which includes all four parts. Because of these complications a brief manual, similar to Huntress' guide to the use of Beilstein, devoted to efficient and speedy use of abstract journals of all kinds would be a useful publication.

The oldest chemical abstract journal now published is the *Chemisches Zentralblatt* which started in 1856, which with its immediate predecessor, the *Pharmazeutisches Zentralblatt*, goes back to 1830. Unfortunately this abstract journal did not abstract material on applied chemistry until 1919, so that for such material before this date one is dependent on the abstract section of *Angewandte Chemie*, then *Zeitschrift für Angewanndte Chemie*, and the *Chemisch-Technisches Ubersicht*, which both go back to the nineteenth century. The latter publication still appears as a weekly part of the *Chemiker Zeitung* which appears twice a week.

France has two principal abstract journals. The one is the "Documentation" section of the *Societe Chimique de France*, Bulletin, which has appeared as an entirely separate section of the bulletin since October of 1933, at which time it also started publication of a separately paged section on physical chemistry under the auspices of the Societe de Chimie Physique. The second abstract journal is the large abstract section of *Chimie et Industrie*, which started in 1919. It is not as well known as it might be that this publication may be obtained in two parts, the Extraits de Chimie, being of course, the abstracts and the Actualite Chimque Industrielle containing the balance of the text. Together they contain all the material of a monthly issue of *Chimie et Industrie*.

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## Booklets & Catalogs

**A105. "Ferrubron"**; a 10-page folder of information on an iron oxide paint pigment of very superior quality and having unusually corrosion-resistant properties. Ferrubron Metal Paint Co.

**A106. Chemicals by Glyco**; very recent edition of this well-known catalog, as handsome and helpful to the chemical specialist as ever. Glyco Products Co.

**A107. Lumarith Products for the Farm**; news-letter describing, with the aid of clever cartoons, the properties of Lumarith that make it superior to glass in the fabrication of hothouses, hotbeds, incubators, and the like—this plastic permitting the transmission of the vital ultra-violet rays. Celluloid Corp.

**A108. Pfanstiehl Chemicals Price List**; catalog listing the rare sugars, amino acids, biochemicals, and other fine chemicals for which this house is internationally known. A "must" for the pharmaceutical chemist. Pfanstiehl Chemical Co.

**A109. Pulverized Walnut Shells**; attractive folder gives the chemical and physical characteristics of walnut shell flour—an up-to-now unfamiliar organic material. The pulverized product is said to be an excellent inert filler for plastics, insecticidal and fungicidal bases, as well as a unique material which, like plastic molding powders, can be pressed (with very little binder, it is said) into useful shapes that take a high polish. Agicide Labs.

**A110. Essenols and Pyressenols**; folder describes and quotes on insecticide odorant bases in concentrated form, as well as on other pyrethrum extracts of interest to the manufacturer of household insecticides. Dodge & Olcott Co.

**A111. Odor-Lac Finish**; leaflet announces a 100% oil paint without the usual paint odor, available for domestic and industrial use. F. G. Okie, Inc.

**A112. Phenolic Resins**; a new booklet, containing suggested formulae with complete data and up-to-the-minute information, arranged for easy reference. Varcum Chemical Corp.

**A113. Resistance of Nickel and its Alloys to Corrosion by Caustic Alloys**; folder includes helpful information for manufacturers of both equipment and caustic alkalies. International Nickel Co., Inc.

**A114. Rhoplex Resins**; third in the series describing the qualities of resin-finished fabrics, of a wide range of surface effects. Rohm & Haas Co.

**A115. Silicate P's & Q's**, September; timely editorial, and some novel uses for silicate of soda, make this an especially worthy edition. Philadelphia Quartz Co.

**E158. The Crown**, August issue; good-looking, newsy organ of interest to packagers in general. Crown Cork & Seal Co.

**E159. Durez Molder**, July; feature space is devoted to the description of one of the largest synthetic resin moldings ever attempted. General Plastics, Inc.

**E160. Durez Plastics News**, July-August, brings notes on product and packaging improvements through the use of plastic parts in novel applications. General Plastics, Inc.

**E161. Electric Vibrating Equipment**, a good-looking, well-illustrated and complete catalog (No. 650) of equipment for feeding, weighing, conveying, drying and screening, all of which function on a unique principle of operation. The Jeffrey-Traylor Division, Jeffrey Mfg. Co.

**E162. Electromet Review**, August; featured this month is a giant rotary kiln of "25-12" chrome-nickel steel, fabricated from 14 tons of stainless material. Electrometallurgical Co.

**E163. The G-Fin Polysection**, Bulletin 1615 gives specifications on a heat exchanger with compensating transfer surface for heating or cooling fluids of low heat conductivity or high viscosity. Griscom-Russell Co.

**E164. Master Weight Tables for Round Seamless Steel Tubing** are offered in Technical Bulletin 15, giving weights per ft. for minimum and average wall tubes; data are presented in easy-to-use tabular form. Babcock & Wilcox Tube Co.

**E165. Metal-Clad Switchgear Bulletins**, Nos. B6012 and B6011, describe cubicle-type controls for incoming power lines, bus circuits, etc., including many illustrations of recent installations. Allis-Chalmers Co.

**E166. The Nash Glass Pump** is ingeniously illustrated in Bulletin No. 313; unit incorporates safety features providing for excess pressure relief, and glass flanges for connection to "Pyrex" piping are standard equipment with this "Pyrex"-lined pump. Nash Engineering Co.

**E167. New Compressors**, Booklet 7502-J describes a new line of industrial compressors and vacuum pumps in a very wide range of capacities and applicability. Ingersoll-Rand Co.

**E168. Nickel Alloy Cast Irons in Gas Manufacturing Equipment**, an excellent and useful brochure that should be of value to maintenance engineers in the chemical industry. International Nickel Co., Inc.

**E169. Nickelsworth, 3rd Quarter**, features plain and graduated monel metal pails, all-weld construction, for rough duty with corrosive solutions. International Nickel Co., Inc.

**E170. Plaskon Handbook**, engineer's manual, a handsomely designed work, describes the properties of molded Plaskon and the technique of molding same. Fabricators will find the Handbook informative and of practical use. Plaskon Co., Inc.

**E171. Portable Voltmeter**, Bulletin No. 538, is built especially for outdoor survey work, proof against rough handling. Bristol Co.

**E172. Process Industries Quarterly**, Second Quarter, 1939; emphasizes pictorially the numerous applications of nickel alloys to the design and fabrication of machinery for the paper and pulp mill. International Nickel Co., Inc.

**E173. Rectifiers for Electroplating and Electrotyping** is a treatise on equipment for producing low-voltage, direct current for electro-deposition. Bulletin ER-102 is profusely illustrated with electrotypes made with copper oxide plate-type rectifiers. Hanson-Van Winkle-Munning Co.

**E174. Steel Horizons**, Vol. 1, No. 3; a beautifully illustrated magazine, in full color, showing most effectively the uses to which alloy steels may be put in the processing industries. Allegheny Ludlum Steel Corp.

**E175. "Tag Celectray" Pyrometers**, Catalog No. 1101E, describes a number of new instruments for indicating and controlling of temperatures; 32 pages, handsomely executed, that should be of interest to the plant executive and engineer. C. J. Tagliabue Mfg. Co.

**E176. Temperature and Pressure Controlling and Recording Indicators**, Bulletin No. 2-17, announces a new group of improved instruments mounted in modern, stream-lined cases. The Brown Instrument Co.

**E177. Thermocouples and Accessories**, a 36-page booklet, announces latest models of temperature-recording devices developed by the Foxboro Company.

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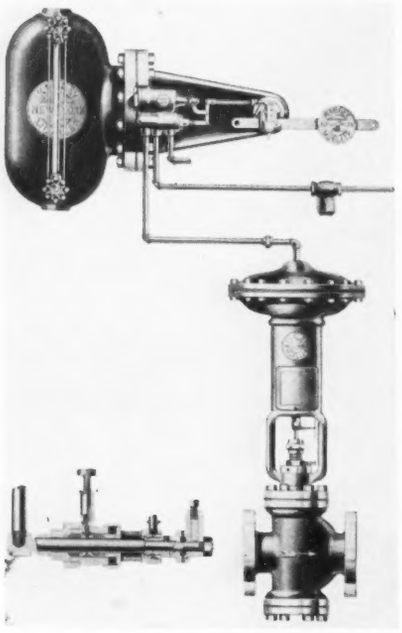
# New Equipment

## Liquid Level Cortoln QC36

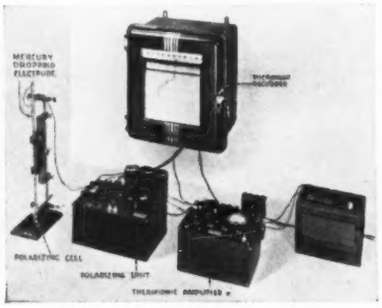
One of the eastern manufacturers of specialties for power installations has placed on the market a series of liquid level controllers, with floats ranging from 6 to 12 inches. Bodies of cast steel, semi-steel, alloy steel, or of made-to-specification material, can be had, including a special method of lead lining for acid service. Of special importance is the ball bearing stuffing-box construction, which includes a stainless steel one-piece shaft. The stuffing-box is novel in that the packing is completely removable from the chamber without breaking the connection of the box in the float chamber—thereby maintaining true alignment on the float shaft at all times.



The controllers are available in direct-connected, pilot-operated, and in air-operated types. They are all designed especially for service in high pressure and/or high temperature systems, or wherever the job to be done is a heavy duty one.

## Electro-Chemograph QC37

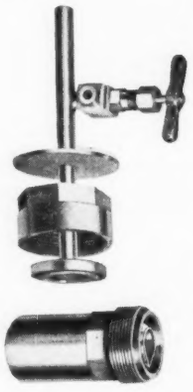
The apparatus illustrated employs a mercury dropping electrode as the measuring cell, for the quantitative and qualitative analysis of aqueous solutions, by determination of current/potential relations. The method of analysis is comparable to the optical spectrographic method in both sensitivity and reproducibility, but is said to be much more rapid in many applications. The manufacturer states that a complete current/potential graph involving several substances can be obtained in 20 minutes or so; less complex mixtures can be determined in correspondingly less time.




For a determination, only a very small amount of dilute solution is required. The outfit is adaptable to the rapid and highly accurate analysis of textile dyes and bleaches, fermented liquors, soap and sugar solutions, and to the routine, or quantitative, analysis of many other industrial products.

## Analytical Bomb for Gasolines QC38

A well-known designer and distributor of fine measuring equipment has just developed an A. S. T. M.-approved combustion bomb for determining gum stability of gasoline. The apparatus is used in conjunction with the A. S. T. M. Method D525-39T, for gum stability tests. Procedure comprises essentially an accelerated oxidation test of gasoline, by means of which the induction period is calculated. The latter may be used as an indication of gum stability—i.e., the tendency of gasoline in storage to form gummy deposits.



Method involves the use of a pressure gauge, of the recording type. The number of minutes from the time the bomb is placed in a bath at a specified constant temperature up to the "break" point, is reported as the induction period. The so-called "break" point is defined in the method as that point provided by a pressure drop of exactly 2 lbs. in 15 minutes, being succeeded in 15 minutes by a second drop of not less than 2 lbs.

## Alkali Wash Solution Tester QC39

This instrument, one model of which is shown, is designed to furnish a very rapid and accurate method for measuring the pH (acidity) of wash solutions such as are used in the dairy, brewery and soft drink industries, and in metal degreasing plants as well. The panel scale of the instrument is calibrated in per cent. caustic soda (sodium hydroxide), measurements being read off directly from the dial.

Device may be had with suitable direct calibration for numerous other applications: testing of distilled water and brines, measuring ash content in sugars, and like simple operations that are repeated many times daily, as in the plant control laboratory.

## Safety Pipette Filler QC40

A finger-operated filler for introducing harmful liquids into pipettes does away with the necessity for drawing them up by vacuum produced by the mouth. New device is handy and convenient to use when working with cyanide, dye, and other harmful solutions. Filler, made of aluminum, has a piston fitted with a valve which allows the piston to draw liquid up the pipette, but prevents the liquid from running out when the piston is lowered. In use, the top of a pipette is inserted into a rubber socket on the lower end of the filler. With a little practice, the user can draw up liquid just as he would with his mouth, and allow it to drain by gravity, just as he would with his finger. The barrel of the pipette filler holds about 3 ml., which amount is drawn up with each full stroke of the piston.

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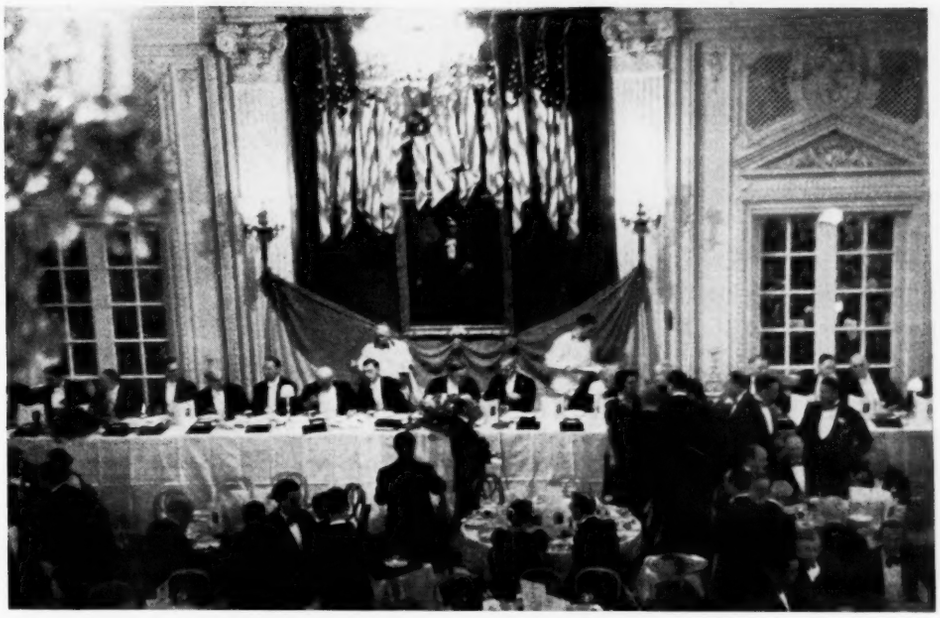
# New Chemicals for Industry

***A digest of products and processes***



## The Nation's Chemists Review Latest Developments at Boston Meeting

***By Walter J. Murphy***

***Managing Editor, Chemical Industries***

THE recent Boston meeting of the American Chemical Society attracted nearly 4,000 chemists and industrialists, a registration only surpassed by the New York meeting of 1935 celebrating the tercentenary of the founding of the American chemical industry. Highlight of the week's deliberations was the celebration of the centenary of the discovery of vulcanization of rubber by Charles Goodyear at a general meeting on Wednesday afternoon, September 13 and at a banquet the same evening at which the principal speakers were P. W. Litchfield, president of Goodyear Tire & Rubber Co., Dr. Karl T. Compton, president of M. I. T., and Dr. James B. Conant, president of Harvard. Other particularly interesting sidelights were the buffet supper party at the New Ocean House, Swampscott, on Monday evening, the garden party in Harvard Yard on Tuesday with Dr. Conant playing the role of host, the informal dance the same evening at the Statler headquarters and the concert by the Boston Symphony Orchestra.

The past meeting was outstanding for the number of papers devoted to medicine or human health. Synthesis of two additional vitamins were reported and the well known Vitamin C was credited with a new use in combating colds. Metals in the human body were shown to be harmless in many instances, a chemical was reported to aid in the stimulation of white corpuscles in the blood stream, new theories on tooth decay were advanced, and "heavy carbon" was discussed by one of the younger men working under Columbia's Urey.

On the industrial side one of the outstanding papers was that by S. D. Douglas, Carbide and Carbon Chemicals, who visualized a bright future for synthetic textiles employing resin in their manufacture. Mr. Douglas' paper was of particular importance in view of the developments of "Vinyon"—which is expected to play a highly important role in the future developments in the hosiery and other equally important fields.

Commonly used fabrics would require a series of "impractical, prohibitively expensive treatments" to give them the "attractive qualities" of synthetic textiles employing resin in their manufacture, the speaker declared in his report.

New polyamide resins of a high molecular weight have been found especially suitable in the manufacture of synthetic fibre, Mr. Douglas pointed out.

"Associated with its low water absorption, wet and dry tensile strengths of the new fibre are practically the same," Mr. Douglas said. "It has been further proved by test that this value can be greatly increased by stretching, without embrittling or otherwise lowering the quality of the yarn."

The latter is "set" by heating under tension to about 65° C. Thereafter, the yarn is stable with respect to shrinkage, up to the temperature of the "set." Above this temperature, shrink-

Left to right, Dr. James E. Tobey, American Institute of Baking; Dr. Robert Spurr Weston, Weston & Simpson, Boston consultants; Dr. Philip M. Kirk, John Brierly, and Dr. B. P. Caldwell, all of Brooklyn "Poly"; and C. S. Boruff, Hiram Walker & Sons.

age occurs, accompanied by a slight reduction in tensile and a corresponding increase in elongation. Shrinkage or crimpage may also be controlled by use of a solvent-non-solvent bath maintained at a suitable temperature.

Copolymer resin woven into other materials, such as cotton, wool or rayon staple, and heated appropriately, gives crease permanency, crease resistance, and improved strength and body particularly when the article is wet.

The thermoplastic nature of this material makes it of special interest when woven into cotton or other fabrics, as an interlayer for starchless shirt collars, similar to the familiar Trubenizing process.

Copolymer fabrics are not attacked by mold or bacteria, a characteristic particularly valuable in the damp climates or in special uses like awnings, fish-lines, and fish-nets. It was established during a recent experiment near the coast of Florida that fish-nets made from copolymer resin caught twice as many fish as did the conventional impregnated cotton nets. Furthermore, in a six-month test, nautical twines made of this material showed no deterioration, while all of the others tested either partly or completely disintegrated during this period.

Because of the chemical inertness of the copolymer resin, industrial uses have been largely investigated thus far but other outlets are now being developed.

The lower molecular weight type is designed for use in the manufacture of staple fibre which has shown considerable promise in the fabrication of wool, cotton and glass felts. In this application, the thermoplastic resin upon heating acts as an efficient binder, giving added strength, and permitting the manufacturing time to be greatly shortened.

The other grade mentioned is somewhat stronger and is used for continuous filament. This material offers possibilities in the manufacture of long-lasting knitted and woven goods and braided articles, especially such items as chemically resistant hose, sporting-goods, and nautical appliances used under such conditions that the thermoplastic properties of the yarn offer no disadvantages. Other valuable characteristics of these fibres include true elasticity, non-combustibility and low electrical conductivity.

While it is possible to attain in commonly used fabrics most of the properties described, such a result can be accomplished only by a series of impractical treatments. These treatments lack permanency and are prohibitively expensive. It is therefore felt that the use of these copolymer fibres which appear to have numerous attractive characteristics not common to other textile materials, will reach considerable volume in this field.

### Phenolic Compounds From Petroleum

The way has been opened to produce phenolic compounds from petroleum fractions on a very large scale in this country, making domestic supplies more easily available, according to a paper delivered by members of the research staff of Standard Oil of California.

Phenols from petroleum are finding extensive use in a variety of industrial applications. As germicides, fungicides and disinfectants they are proving at least the equal of well known products now on the market, at the same time their application is being extended to insecticides for the control of tree pests.

For all of these uses, phenolic compounds are prepared in water-soluble form, which solution may be diluted as required before application. Products of this type meet the rigid requirements of the Bureau of Animal Industry of the U. S. Dept. of Agriculture. Another important use for these phenolic products from petroleum is as flotation agents in the mining industry, and there is every possibility that they will be very valuable in the manufacture of various synthetic plastics.

Until recently, disinfectants of the carbolic acid type which contain chemical compounds known as phenols were obtained directly from the distillation products of coal tar. Now, a new source of these compounds has been made available from petroleum.

It has been demonstrated, according to the authors of this paper, that not only have phenolic compounds from petroleum proved to be at least the equal of phenols from coal tar sources in their general properties and chemical reactions, but some of them prove superior when tested by such well known biological tests as the F.D.A. Phenol Coefficient Test for germ-killing power. This particular test is of considerable importance in the evaluation of antiseptics, germicides and fungicides, since it measures the efficiency of the sample under examination to kill actual typhoid germs by comparison with pure carbolic acid which is used as the standard.

These newly developed phenolic compounds are usually obtained from petroleum fractions which have been made by cracking processes; the phenols are extracted by means of aqueous caustic soda solution, which extract is then neutralized with acid causing the crude phenols to rise to the top. This crude product is then separated and purified.

### Diketene Now Made Commercially

The once rare chemical, diketene, is now being produced in commercial quantities for a wide variety of industrial uses, according to a paper presented by Dr. A. B. Boese, Jr. The speaker emphasized in his talk that the chief obstacle to the widespread industrial use of diketene has been difficulties in preparing this compound on a commercial scale. It is therefore understandable that, when diketene was first isolated by Chick and Wilsmore in 1908, the new compound was merely of academic interest. Even in 1910, its discoverers wrote: "the preparation of cyclobutane-1,3-diene (diketene) may be recommended as a useful exercise for students in laboratories where a supply of liquid air is available."

Today, it was explained, diketene is used in commercial quantities, in making chemicals for the manufacture of dyestuffs, printing inks, wood stains, pharmaceuticals, photographic chemicals, corrosion inhibitors and many other industrially important products.

It is not what it does, but what is done with it that makes diketene important. In other words the present and future importance of diketene lies primarily in its exceptional chemical reactivity and, consequently, in the products which may be synthesized from it.

This colorless but intensely pungent liquid reacts readily with alcohols to produce the important acetoacetic esters; and this can be done more easily than by the troublesome and hazardous sodium condensation of acetate esters. The acetoacetic esters are important intermediates in the making of the valuable analgesic, antipyrine.

The acetoacetanilides are other important diketene derivatives. They are used as intermediates for the production of the

Hansa Yellow dyes formed by coupling them with diazonium compounds. Because of their stability, light-fastness, insolubility in the common organic solvents, and great tinctorial value, the Hansa Yellows are becoming increasingly important as pigments for a wide variety of surface coatings.

Benzene and other aromatic hydrocarbons will, when suitably catalyzed, readily react with diketene to yield another series of interesting compounds. Some make excellent plasticizers for the important vinyl resins, and others are used in synthesizing quinaldehyde, a chemical of interest in the photographic field.

Diketene molecules can also be made to unite with each other (to polymerize) so as to give dehydracetic acid which is used in making compounds of potential value in the pharmaceutical and dyestuff fields. One of them, orcinol, can also be used as a photographic developer.

Conversely, diketene can be depolymerized to ketene by pyrolysis, thus affording, for the first time, a convenient and simple process for rapidly producing pure ketene uncontaminated by methane and other hydrocarbons and oxides of carbon.

Users of chemicals will be interested in the properties and advantages of diketene. With a boiling point of 127.4° C. and a freezing point of –6.5° C., this compound can be safely shipped and stored in aluminum containers when it is in a frozen condition. Its stability and purity is maximum when the diketene is distilled at sub-atmospheric pressure. The pure compound will keep for years at temperatures below 10° C.

A large number of products synthesized from diketene can be produced more economically and with greater ease than by conventional methods. Higher yields and purer products can generally be obtained. In numerous cases the reaction time is reduced. Many of the reactions with diketene generate enough heat so that no external heat need be applied.

### Interesting Pigment Developments

In the construction of exterior house paints, according to a paper presented by members of the Krebs Pigment and Color Corp., there has been a gradual evolution activated by the constant desire of manufacturers to produce improved products having better durability and lower cost with greater consumer satisfaction. The evolution of these paints has been from lead-in-oil to lead-zinc paints, subsequently to lithopone exterior paints and finally to paints carrying titanium dioxide.

Properly formulated titanium type paints under normal conditions of exposure give excellent durability and a clean white appearance. Ultimate failure is by slow chalking and erosion thus leaving an excellent surface for repaint work.

These advantages in appearance and durability coupled with markedly superior hiding power because of the high refractive index of this pigment are being more and more appreciated. This is indicated by the continually increasing demand for such pigments and the widespread popularity of the new self-cleaning white outside house paints.

Until recently, however, the use of white titanium dioxide in tinted outside house paints involved danger of excessive chalking and fading. This difficulty has been recognized for a number of years during which time extensive research and development work has been done in order to solve this problem.

As a result of these exhaustive investigations, white titanium dioxide pigments are now available with inherently slower chalking and greatly improved tint retention properties yet retaining, to a marked degree, the self-cleaning and excellent durability characteristics generally associated with titanium type pigments.

One pigment is a commercially pure white titanium dioxide manufactured by a process which gives to it improved resistance to chalking during exterior exposure. It provides the paint manufacturer with an opportunity of obtaining slightly better gloss and gloss retention as well as fade resistance without sacrifices in color or hiding power. Its special field is enamels and lacquers both interior and exterior where it can be used to very definite advantage. The fade resistant characteristics of this pigment, however, are not marked in house paint; accordingly, it is not generally recommended for use in tinted exterior house paints. Minor improvements, however, in gloss, chalking, and fade resistance may be realized in outside house paints by the use of this pigment in place of the regular grades of titanium dioxide.

Another pigment is white with a slightly yellow undertone. It is decidedly more chalk resistant than regular titanium dioxide and considerably more chalk resistant than the first pigment and it provides the paint manufacturer with an opportunity of producing a single base paint for whites and a full line of tints, though it is recognized that in whites it does not yield the clear brilliant outstanding white of ordinary titanium dioxide. It can be used throughout a wide range of percentages in exterior paint formulas, which gives considerable leeway in meeting hiding power and cost requirements.

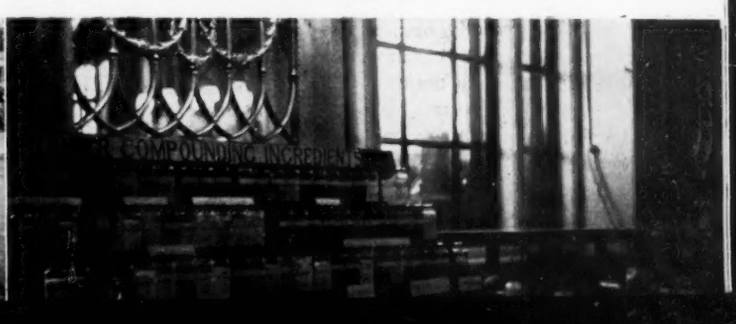
In preparing exterior paints with this second pigment, sufficient cofumed 35% leaded zinc oxide should be incorporated to inhibit mildew. Generally 40 to 45% of cofumed 35% leaded zinc oxide calculated on the total pigment in the paint has given adequate protection. Likewise, sufficient extender should be used to give the paint a satisfactory pigment volume. Under these conditions, paints will be produced which are decidedly better than lead-in-oil in hiding power, durability, tint retention, and cleanness; and markedly superior to lead-zinc paints in hiding power and durability.

### New Products from Naphthalene

Naphthalene is the parent of a series of new hydrocarbon products including a viscous high-boiling oil, a brittle glass-like resin and an infusible organic powder, according to a paper by N. D. Scott and J. F. Walker of Du Pont. Although it is still too soon to say whether these materials will be of commercial value, they possess unusual properties of definite interest to industrial chemists. They are close chemical relatives of naphthalene and are prepared from this raw material by a novel process employing sodium. Their discovery marks another advance in the field of coal tar chemistry.

These products possess an unusual degree of stability. On heating, they are actively decomposed only at temperatures above 700° F. They are insoluble in water and alcohol and are unaffected by long exposure to these agents. They are also inert to acids and strong alkalis. The brittle glass-like materials, which may be described as white asphalts, are fusible, having

Below left, part of the crowd which attended the outing and buffet supper at the Ocean House, Swampscott; right, the very interesting rubber display at the Copley-Plaza celebrating the centenary of the discovery of the method of vulcanizing rubber.



melting points up to 300° F. The lowest melting member of this series is a viscous oil at ordinary temperatures.

Both the oil and the resins are soluble in many organic solvents and can be blended with vegetable oils, waxes, etc. The infusible powder previously referred to is made up of tiny droplets of transparent resin. On heating, it chars at temperatures slightly below red heat, but does not melt. Although completely insoluble in most liquids, it swells on heating in high-boiling chlorinated hydrocarbons forming thick solutions which set to a jelly on being cooled.

The first step in the preparation of the new products consists in the conversion of naphthalene to liquids known as dihydronaphthalenes. This conversion is affected by reacting sodium with naphthalene dissolved in alcohol. The dihydronaphthalenes formed by this process are spontaneously converted to the new materials by treatment with a brilliant green solution formed by the reaction of sodium and naphthalene in a special ether solvent.

The nature of the products depends on the temperature at which the reaction is carried out, the time allowed and the relative amounts of the materials employed. Different products can thus be obtained from the same raw materials. Although the dihydronaphthalenes have been known to chemists for a long time, the production of resinous products from these materials has not been previously accomplished.

### Still Further New Uses for Zein

New uses for zein, an industrial protein available only as a by-product of corn processing, were predicted by L. C. Swallen of Corn Products Refining.

A demand for zein in the production of food wrappings or containers, films and fibers, and quick drying printing inks was forecast by Mr. Swallen. Commercially produced as a fine powder of a slightly yellow color and containing 7 or 8% of volatile or readily vaporizable matter and not over 2% of non-protein solids, zein has a potential yield of approximately one pound per bushel of corn, he said.

The outstanding use for zein appears to be in the paper coating field. "As a decorative coating for magazine covers, labels and similar uses it gives a very pleasing surface without the high gloss characteristic of some other coating materials. It can also be formulated with a high gloss and is particularly notable for resistance to scuffing.

Zein is particularly outstanding in its resistance to penetration by greases or oils and therefore has a large potential use in the making of food wrappings or containers where this property is of importance. This property is also useful in that a very thin layer on paper or other absorbent material will permit the application of a wax coating without penetration of the paper. It is also effective as a sealing coat against asphalt or phenolic resins which are very difficult to seal with other available materials.

While the use of zein in printing inks is still in the development stage, it gives promise of being very useful in that inks prepared with it dry with extreme rapidity. It also is expected that eventually the production of films and fibers from zein will be an outstanding use. However, these developments must be deferred until more satisfactory methods of curing zein have been evolved.

### Hydrogen Fluoride Offers Possibilities

Anhydrous hydrogen fluoride is now commercially available in quantity, Prof. J. H. Simons of Penn. State reported. It has recently been shown to be a very useful reagent in the making of organic chemicals. Under certain conditions it polymerizes unsaturated compounds. Under other conditions it can be used to prepare simple organic compounds in good yields without the formation of any appreciable amount of unwanted substances. It can be used to alkylate aromatic compounds with alkyl halides, olefins, alcohols, ethers, esters, etc., as the reagents. It also is useful in the preparation of ketones in which the reagent may be the carboxylic acid, the acid anhydride, the acid chloride or the ester.

The physical properties of hydrogen fluoride offer unusual advantages in manufacturing processes. Its low formula weight gives more effective chemical per unit of either weight or volume than any other reagent. Its convenient boiling point, very low freezing point, and high fluidity enable it to be handled as a liquid or gas under all plant conditions. It can, therefore, be handled exclusively in pipes and controlled by valves. The plant design and operation can therefore be greatly improved and simplified.

It can be easily recovered by distillation after it has been used in a reaction. This is not true of any other agent for the same reactions. As obnoxious sludges and tars are not formed the separation of the desired products is also improved and simplified. Yields should be higher and costs reduced.

Hydrogen fluoride is a relatively inexpensive chemical when the cost per formula weight, i.e., per chemical effectiveness is considered. It comes somewhat above sulfuric acid but considerably below aluminum chloride. Neither of these two can be recovered whereas hydrogen fluoride can.

# New Products

**Month's New Dyes** Direct color Benzoform Brilliant Blue G, on after-treatment with formaldehyde, is said to produce on cotton and rayon a bright greenish blue. New dyestuff is said to have a satisfactory fastness to washing, and very easy dischargeability. When aftertreated with copper sulfate, the fabric possesses good fastness to light, according to the manufacturer.

**Pore-Free Metal Coating** A steelmaker has developed this summer a metallic coating which is said to be entirely non-porous, and superior in corrosion resistance to present coatings for metal. New finish is claimed to be economical in cost and therefore is expected to open up new applications for tonnage steel. It will be sold under the name "Corronite."

**Corrosion-Resistant Rubberized Wax** Pipes and cables are being successfully protected from corrosion with "Suprax," according to its English manufacturer. Material consists of rubber intimately mixed with waxes and other inert fillers. It is applied to the tubing by extrusion and, because sulfur-free, is claimed not to require vulcanization. Compound is described as pliable and workable by hand at room temperatures, and to be capable of displacing hard and soft rubber compositions in numerous applications—e.g., as anti-friction and anti-noise material between metal-to-metal joints.

**Heavy-Duty Enamel** Coating material, for use on concrete floors, fire doors, pipe lines, machinery, etc., is known as "Baertex." It is said that it will give about 40% longer wear than most paints intended for such heavy duty. Coverage is about 500 sq. ft. per gallon, and a coat dries overnight to a hard, glossy finish, according to the formulator.

**Industrial Odorant—Santomask** Product, newly developed to overcome the objectionable after-odors evident in interior paint jobs, is a vanillin derivative. When added to paint, varnish, and enamel mixes, it is said to completely neutralize the paint odors rather than merely to cover them up, since the compound has no distinctive odor of its own.

# Chemical Specialties for Industry

***A digest of new uses and new compounds***

## *Formulation of Ink Specialties*

**By Dr. Charles F. Mason**

**Many an otherwise excellent chemical specialty fails to find favor with the consumer because of the failure to employ a sales-building package. Outstanding in design is this new drawing ink assortment of eight colors launched by Chas. M. Higgins & Co., Brooklyn, a perfect example of all that a good package should be.**

NO one can safely commit himself upon how early man in his history first used signs and symbols as reminders to himself and to convey information to his fellow beings. The markings found upon papyrus and earthenware in the excavations of ancient Egypt bear positive evidence that carbon was the basic marking substance 20 to 25 centuries before the Christian era. Even though these markings look crude to one accustomed to modern pictorial expression they are equal from an artistic standpoint to many found today upon the walls of public buildings.

The tanning of leather was being practiced before the present era and even though many must have observed the darkening effect of iron salts upon tanned leather man had to wait until the 18th century for black iron tannin inks. This was long after the advent of the printing art. Progress has been rapid since the turn of the present century and today it is not uncommon to purchase inks ranging from black through all shades of basic colors to white and having metallic lustres or special optical properties.

They are rapidly being placed upon a scientific basis even to the point of detecting erasures and forgeries in legal technique. Extensive investigations have been conducted by government bureaus both at home and abroad to determine the best combinations, which will insure permanence of records, ease of application, and minimum corrosion to the implements of application. To date their nomenclature consists of descriptive titles, many of which are misleading to one not skilled in the art.

Government specifications have been set with too much emphasis upon chemical composition and insufficient attention to physical properties in that some of the starting materials are products of nature which vary in the content of essential ingredients. Again no one can safely say when inks became articles of commerce as they were prepared individually in the home by the privileged few in the reign of Queen Elizabeth in England. A prized formula at that time consisted of one quart of strong ale, four ounces of gum arabic, two ounces of gall nuts (crushed), one ounce of copperas, with the stipulation that after mixing it should stand for 14 days and after straining was ready for use. This is a wide departure from printing and writing inks which are now delivered to newspaper plants in tank trucks.

The list of inks below may contain some omissions but it is an example of many available today and the confusion of adhering strictly to descriptive titles alone.

1. Printing
2. Ceramic
3. Copying
4. Finger print
5. Glass
6. Hectograph
7. Indelible
8. Transfer
9. Waterproof
10. Invisible
11. Rotogravure
12. Stick
13. Frosting
14. Intaglio
15. Transparent
16. Manifolding
17. India
18. Laundry
19. Lithographic
20. Luminous
21. Mimeographic
22. Stencil
23. Sympathetic
24. White
25. Drawing
26. Metallic
27. Stamping
28. Engraving
29. Heliographic
30. Photo-gravure
31. Fluorescent

**Resin Oil Base**

1. Printing
2. Lithographic
3. Mimeographic
4. Ceramic
5. Intaglio

**Resin and volatile solvent vehicle**

1. Finger-print
2. Indelible
3. Transparent
4. Manifolding
5. Luminous
6. Stencil
7. Sympathetic
8. Stamping
9. Heliographic

In view of the fact that the five inks listed under the caption resin oil base are closely allied to paints and varnishes and should not be classed as inks at all, any formulas for them will be omitted until a future article on these products is written. Those listed under the next caption to the right do not all belong here as for instance stamping, luminous, stencil and indelible inks can be made with a water base but more recent formulas are veering away from water. This makes it obvious, that any method of classification is difficult.

### Stamping Inks

This type, which is used in offices is applied either with a rubber or metal implement and was affected by the humidity of the atmosphere due to the carelessness of leaving the pad exposed when not in use. However recently the simple glycerol, water, dye mixture has been improved upon and this trouble has been lessened.

| | |
|---|---|
| Glycerol | 39 parts |
| Water | 39 |
| Butyl Carbitol | 19 |
| Nigrosine (Water sol.) | 3 |

The dye is dissolved in the water and when solution is complete the other two components are added. In case different colors are desired crystal violet can be substituted for Nigrosine in the amount of 1.60 or Fuchsine 1.60.

#### Writing Ink

| | |
|---|---|
| Tannic acid | 11.7 parts |
| Gallic acid | 3.8 |
| Ferrous Sulfate (crystals) | 15.0 |
| Hydrochloric acid 10% | 12.5 |
| Phenol | 1.0 |
| Dye | 3.5 |
| Water | 952.5 |

This is made by simple mixing with one exception, which is that the dye should be ground with a small amount of the water in a separate container to hasten solution. The phenol is added to prevent mold formation and the hydrochloric acid is made by diluting the commercial variety of 20 degree Baume with two parts of water by volume.

#### Copying and Record Ink

| | |
|---|---|
| Tannic acid | 23.4 parts |
| Gallic acid | 7.7 |
| Ferrous sulfate (crystals) | 30.0 |
| Hydrochloric acid 10% | 25.0 |
| Phenol | 1.0 |
| Glue | 3.5 |
| Water | 909.4 |

This also is made by simple mixing, except that the glue should be softened over night with a portion of the water in a separate container and then heated over warm water the next day until a smooth clear solution is obtained. It can then be added to the other mixture. It is obvious that in case these inks are shipped in large quantities long distances freight is paid for carrying water. To obviate this they can be made in paste form and diluted with water at the point of use. Three examples are given below.

#### Concentrated Writing Ink (Powder form)

| | |
|---|---|
| Gallic acid (crystals) | 3817 parts |
| Ferric sulfate (anhydrous) | 4084 |
| Oxalic acid (crystals) | 763 |
| Soluble blue dye | 1336 |

Intimate mixing in a porcelain pebble mill before packaging will greatly facilitate solution at the point of use. In case tartaric acid is available it can be substituted for oxalic in one half the amount specified above.

#### Concentrated Writing Ink (Paste form)

| | |
|---|---|
| Gallic acid | 333 parts |
| Ferric sulfate (crystals) | 500 |
| Sulfuric acid (anhydrous) | 22 |
| Soluble blue dye | 116 |
| Water | 29 |

The figure 22 specified for sulfuric acid is equivalent to 24 of the commercial variety, which is sold as 66° Baume. Intimate mixing in an acid resistant grinder is necessary and the water can be varied to give a smooth paste. This should be packaged in glass as tin cans or metal tubes would be corroded.

#### Hectograph Ink

| | |
|---|---|
| Acetone | 8 parts |
| Glycerine | 20 |
| Acetic acid 20% | 10 |
| Water | 50 |
| Dextrine | 2 |
| Dye | 10 |

This is made by a simple mixing operation and is used upon a duplicating machine in which a sheet of gelatine is the transfer medium. The dyes are either methyl or crystal violet for blue shades and Rhodamine B for red ones. In the majority of cases the companies, which sell these machines specify that they alone must sell the ink along with service charges to avoid damage to the equipment by unscrupulous compounders.

#### Indelible Ink for Textiles (Laundry Ink)

| | | | |
|---|---|---|---|
| | Silver nitrate | 41 parts | 2. Sodium Carbonate 16 parts |
| 1. | Water | 41 | Water 84 |
| | Ammonium Hydroxide | 18 | |
| | | | Gum Arabic 33 parts |
| | | | 3. Water 67 |

Solutions numbers 1 and 2 are made by simple mixing but number 3 must be made with the aid of indirect heat and stirring until a smooth jelly is obtained. The three are then mixed and warmed until the color begins to darken when it can be applied with either a gold pen or a quill. Application of a hot flat iron or exposure to a strong source of light will set the markings and make them resistant to alkaline laundry and bleaching solutions. Only an excess of bleach will affect it.

#### Sympathetic Ink (Invisible)

| | |
|---|---|
| Nitro cellulose | 3 parts |
| Cellosolve acetate | 97 |

This is a simple mixing operation if the solids are purchased in the softened form, which is gelatinous. Markings upon paper are invisible after drying but visible upon wetting the paper with water. It has been used in special forms of advertising and for transmitting secret messages in code. These have been known since salts of metals were made available for sale and a large number serve the purpose but heat must be applied to make the markings visible and after that reversion is impossible, but the formula given above produces signs which become invisible again upon drying of the paper.

A few of such salts, which can be applied from solution are ammonium chloride, lead acetate, ferric sulfate, mercuric choride, cupric sulfate, cobaltic chloride, and nickelic chloride.

#### Another Sympathetic Ink

| | |
|---|---|
| Alcohol | 14 parts |
| Phenolphthalein | 5 |
| Carbon Tetrachloride | 9 |
| Glycerol | 72 |

In this case the markings are invisible until touched or moistened with a solution of an alkali like borax, sodium or potassium hydroxide. Others are available, which require treatment with acid or ammonia in the vapor state and appear to be safer for transmitting messages than the one, where only the readily available water is necessary.

#### Stencil or Marking Ink

| | |
|---|---|
| Shellac solution (5 lb. per gal.) | 25 parts |
| Beeswax | 2 |
| Turpentine | 6 |
| Alcohol | 61 |
| Pigment | 6 |

The beeswax and turpentine are heated indirectly without a direct flame until solution is complete and upon cooling to a gelatinous mass the pigment is stirred in and wet with alcohol until a smooth mixture is obtained. The shellac and the balance of the alcohol is then added and mixing continued until the desired marking properties are obtained.

**Meat Stamping Ink**

| | |
|---|---|
| Nigrosine | 7 parts |
| Glycerol | 19 |
| Acetic acid 70% | 6 |
| Alcohol | 68 |

This is made by simple mixing and although a dye, glycerol and acetic acid are deposited after evaporation of the alcohol, only the dye is dangerous to foods but it is usually removed by meat dealers.

**Indelible Ink**

| | |
|---|---|
| Induline (water soluble) | 1 part |
| Water | 982 |
| Sodium hydroxide | 1 |
| Lampblack | 14 |
| Soft soap | 2 |

The soft soap and lampblack are mixed between rollers until every particle of pigment is surrounded by soap and if necessary some of the water may be added to facilitate smoothness. The other three components are mixed and warmed in a separate container and finally the two are united into one.

**Glass and Porcelain Ink**

| | |
|---|---|
| Rosin | 5 parts |
| Alcohol | 36 |
| Borax | 4 |
| Water | 50 |
| Nigrosine | 5 |

The rosin is dissolved in the alcohol in one container and the borax with water in another. The two are mixed and allowed to stand about sixteen hours after which the strained solution can be mixed with the dye.

The writer makes no claim that each formula presented is the best possible combination for the purpose but does wish to state that each one is satisfactory for present needs. Adjustments of physical properties like viscosity, settling of pigments, time of drying, and penetration can be adjusted to fit specific needs and from this information the experimenter has a starting point, from which to work. It is obvious that there is still a wide field of experiments to be covered in the sizing of paper and the correct ink to use for each as evidenced in comparing the readability of two newspapers in lamp light. Striking differences can be noted in some.

# New Specialties

**Wrinkle Finishes for Pliable Materials** This summer were developed and perfected a number of wrinkle-effects applicable to flexible materials such as paper, leather, and textiles. After spraying, or other manner of application, the finish dries into a wrinkle texture of uniform appearance and consistency—from small to coarse in grain, as desired—in much the same manner that it coats upon metal products. Once applied, the wrinkle coating is said not to chip or peel, as it is virtually welded into its supporting material.

**One-Coat Lacquer Substitute** New coating material forms an air-dried, tough glossy finish, and is said to cover from 30 to 50% greater area than an ordinary lacquer. One application of "Tops"—trade mark of this product—is claimed by the manufacturer to give the equivalent of 2 coats of lacquer. "Tops" is said to flow out beautifully and to rub easily to a brilliant luster.

**Adherent Black Enamel for Steel Products** A penetrating black coating for steels is recommended particularly for the priming of threaded parts and assemblies, or other precision-tooled members, for it is claimed by the formulator that the dimensional relationships of the surfaces concerned are in no way distorted. Enamel can be used alone as a protective coating, or as a primer for the subsequent application of other finishes.

**White Sidewall Tire Paint** One of the principal tire manufacturers has brought out a self-vulcanizing white paint for the sidewalls of tires. Made with a latex base, new coating compound is said to be washable and elastic (hence, is not easily cracked or chipped), and to dry quickly after brush application.

**Odorless Finishes** Objectionable odors have been successfully removed from interior paints, according to a paint maker, who has just placed on the market a series of flat and gloss paints for use where washability and wearing qualities are considered the most important. This coating material is said to possess all the advantages of an oil paint, plus the added advantages of incorporating recently developed materials that afford an odorless and efficient interior paint.

**Synthetic Resin Cement** Just made available is a new, impervious resin cement that is applied as a quick-setting cement. Product, whose trade mark is "Korez," sets by chemical action at room temperature to a dense, strong, jointing material, according to the manufacturer. The bonding material is said to be impervious and inert to acids, oil, water, and mild alkalies at temperatures up to 330° F.

# The Specialty Maker's Plant Notebook

**By Charles S. Glickman***

**Anti-Freeze, Hydraulic Brake Fluid:** A new synthetic resin recently perfected has proved its value as an essential component of automobile anti-freeze and hydraulic brake fluid preparations. This product, colorless and odorless, is easily dissolved in either alcohol or water to form viscous liquids of high boiling point and low freezing point. There is very little change in viscosity over normal ranges of temperature. It is harmless to rubber, copper, iron, etc. Formulas for its use are available.

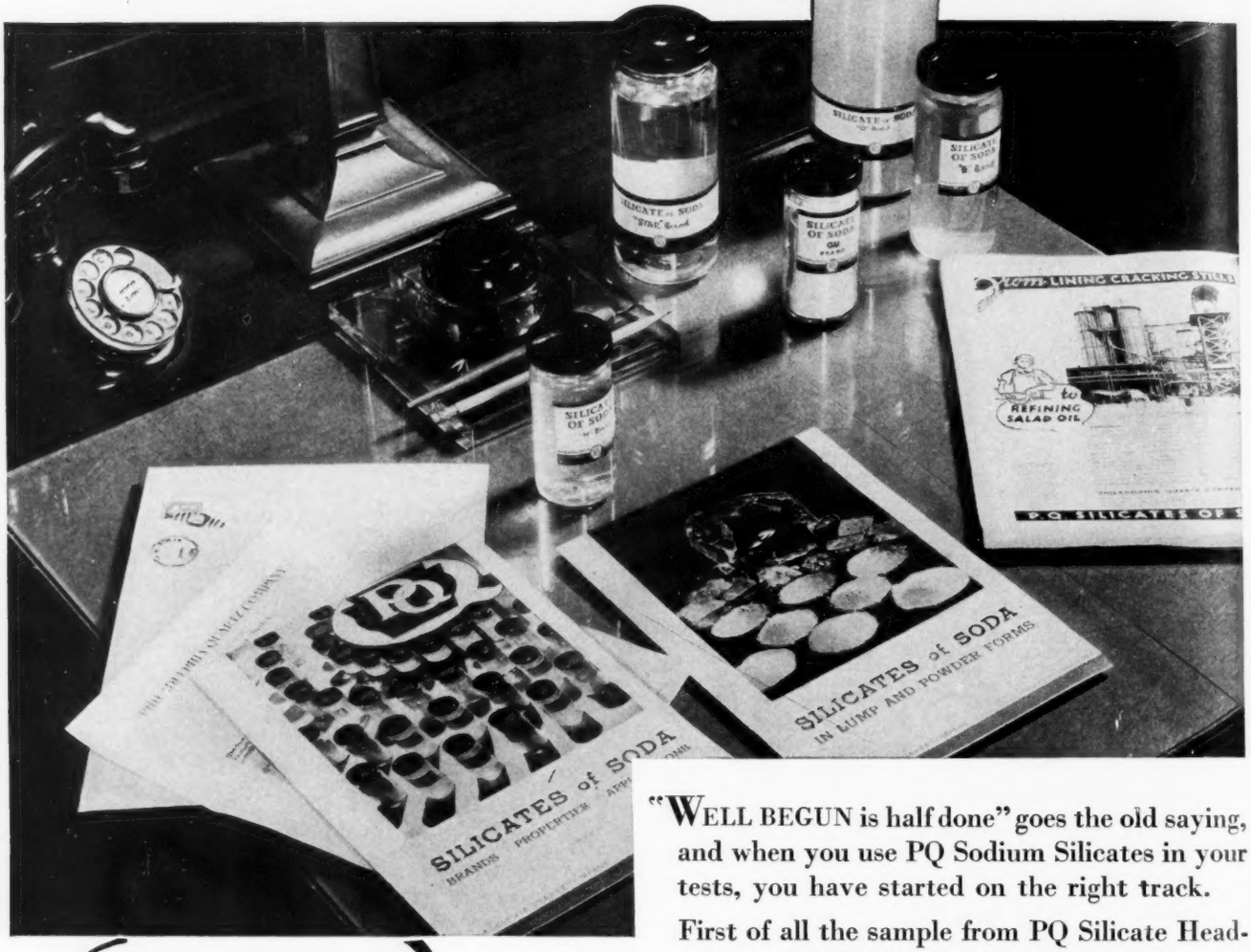
**Automobile, Furniture Polish:** A new soapless emulsifier compatible with oils or solvents and emulsifiable in water has recently been perfected for use in various types of polishes. When used in accordance with the formulas supplied it yields fast-drying, glossy polishes of light color and low cost. It is free from alkali, etc.

**Artificial Leather and Fabric Coatings:** A new type of synthetic finish suitable for spraying, calendering or embossing on leather, paper, rubber or fabrics is now available at a cost of from $2-4 per gallon. Its application results in a highly flexible, non-tacky, glossy finish at a cost of but 2c per square foot for a completed series of five applications. It requires no priming coat or sizing. It is available in a variety of colors as well as a clear solution. On ordinary kraft paper it is difficult to detect from real leather and repeated bendings and creasings show no marks. The approximate coverage of the reduced product is about 1000 square feet per gallon. Its use on mesh fabrics yields materials suitable for imitation novelty leather goods or women's slippers.

Information regarding any or all of these products or processes are obtainable upon request by writing to CHEMICAL INDUSTRIES.

* Technical Director, Manufacturers Testing Laboratories, N. Y. City.

# A GOOD START
## FOR YOUR EXPERIMENT




"WELL BEGUN is half done" goes the old saying, and when you use PQ Sodium Silicates in your tests, you have started on the right track.

First of all the sample from PQ Silicate Headquarters is fresh (it's dated!). Because there are 33 grades in PQ's Catalog, we can help you get the one with the correct properties for your purpose.

Of course, you're welcome to the knowledge of soluble silicates in industry which we began to accumulate over 75 years ago and which is being added to daily.

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**General Offices and Laboratory: 126 S. Third St., Philadelphia, Pa. Chicago Sales Office: Engineering Bldg. Sold in Canada by National Silicates Ltd., Toronto, Ont. Nine plants. Distributors in over 60 cities.**

## Trade Mark Descriptions†

**No. 369,371.** Not subject to opposition. Penick & Ford, Ltd., N. Y. City; Mar. 9, '39; for finishes for papers, textiles, and laundry starch; use since Jan. 15, 1918.

**No. 369,535.** Federal Research Products, Inc., N. Y. City; May 9, '38; for flame-proofing compounds for fire-proofing fibrous and cellulosic textiles; use since Jan. '35.

**No. 369,548.** Not subject to opposition. The Glidden Co., Cleveland, O.; Apr. 6, '39; for ready-mixed paints, colors in oil, paste paints, lacquers, varnishes, enamels, polishes for automobiles and furniture, and the like; use since Feb. 10, '37.

**No. 369,551.** Not subject to opposition. A. E. Staley Mfg. Co., Decatur, Ill.; May 15, '39; for laundry starch; use since 1912.

**Nos. 369,540-41.** Neither subject to opposition. The Griffith Laboratories, Inc., Chicago, Ill.; July 20, '38; for salt composition for use in curing meats and like animal products; use since June 2, '38.

**No. 400,711.** Wasatch Oil Refining Co., Woods Cross and Salt Lake City, Utah; Dec. 10, '37; for gasoline; use since Aug. 1, '33.

**No. 389,682.** The Glidden Co., Cleveland, O.; Mar. 5, '37; for ready-mixed paints, colors in oil, paint enamels, paste paints, lacquers, varnishes, enamels, polishes for automobiles and furniture, and the like; use since Feb. 10, '37.

**No. 402,895.** Continental Oil Co., Ponca City, Okla.; Feb. 10, '38; for lubricating oil; use since Aug. 6, '34.

**No. 402,320.** Vegetable Oil Products Co., Inc., Los Angeles, Calif.; Jan. 25, '39; for hydrogenated cottonseed oil shortening; use since Nov. 30, '37.

**No. 406,753.** Dingman-Lorenz Labs., Pittsburgh, Pa.; May 26, '38; for bleaching fluid; use since May 10, '38.

**No. 411,842.** Alvah A. Seibert (Perfection Prods. Co.), Cairo, Ill.; Oct. 20, '38; for filter powder for chlorinated solvent cleaning units; use since July 1, '36.

**No. 412,546.** Duro Test Corp., No. Bergen, N. J.; Nov. 9, '38; for coloring material for incandescent bulbs; use since Oct. 3, '38.

**No. 412,945.** Cherry-Burrell Corp., Chicago, Ill.; Nov. 19, '38; for chemical preparations for treating dairy products to improve their flavor; use since Apr. 6, '38.

**Nos. 413,161-2.** Sugar Beet Prods. Co., Saginaw, Mich.; Nov. 25, '38; for cleaning and water-softening compound for household cleaning; use since June 1, '38.

**No. 414,904.** Tret-o-Lite Co., Webster Groves, Mo.; Jan. 16, '39; for organic compounds and solutions for petroleum refining; use since Dec. 15, '38.

**No. 415,138.** W. H. Orr (Surety Waterproofing Co.), San Francisco, Calif.; Jan. 23, '39; for material for water-proofing concrete; use since Jan. 1, '39.

**No. 415,185.** Radiant Finish Co., Chicago, Ill.; Jan. 24, '39; for varnish-like finish for automotive equipment and the like; use since Apr. 2, '38.

**No. 415,731.** Meutsch, Voigtlander & Co., vormals Gewerkschaft Wallram, Essen-Ruhr, Germany; Feb. 7, '39; for tungsten, molybdenum, titanium, tantalum, niobium, and other metals, and their carbides.

**No. 415,780.** International Filter Co., Chicago, Ill.; Feb. 8, '39; for liquid treating apparatus and equipment in particular, for treating chemically water supplies and water wastes of municipalities, institutions, and industrial plants; use since January, '39.

**No. 416,076.** Titanium Alloy Mfg. Co., Niagara Falls, N. Y.; Feb. 15, '39; for opaquing agents and pigments for making enamels and glazes; use since Dec. 7, '38.

**No. 416,246.** Bradford Oil Refining Co., Bradford, Pa.; Feb. 20, '39; for lubricating oils; use since Feb. 1, '39.

**No. 416,467.** Lignocrete Limited, Georgetown, British Guiana; Feb. 27, '39; for cementitious paints; use since 1938.

**No. 416,556.** Grand Rapids Varnish Corp., Grand Rapids, Mich.; Mar. 1, '39; for general industrial finishes—namely, varnishes, ready-mixed paints, paint enamels, and lacquers; use since Jan. 2, '39.

**No. 416,558.** Granitize Labs., Burlingame, Calif.; Mar. 1, '39; for automobile body cleaner having incidental polishing properties; use since Mar. 15, '38.

**No. 416,680.** Calcium Chemical Corp., Adams, Mass., and Easton, Pa.; Mar. 4, '39; for carbonate pigments; use since Sept. 2, '38.

**No. 416,759.** Atlas Powder Co., Wilmington, Del.; Mar. 7, '39; for flock coated paper or fabric commonly known as leather cloth; use since Feb. 8, '39.

**No. 416,981.** Brunswick-Balke-Collender Co., Chicago, Ill.; Mar. 13, '39; for base coat for bowling alley beds, in the nature of a lacquer; use since Aug. 15, '38.

**No. 417,139.** Patterson-Sargent Co., Cleveland, O.; Mar. 16, '39; for paints, enamels, stains, lacquers, and varnishes; use since Aug. 12, '33.

**No. 417,253.** Baird & McGuire, Inc., Holbrook, Mass.; Mar. 20, '39; for insecticides; use since Apr. 18, 1924.

**No. 417,257.** California Spray-Chemical Corp., Wilmington, Del. and Richmond, Calif.; Mar. 20, '39; for parasiticides; use since Feb. 17, '38.

**No. 417,427.** Thodenol Soap Corp., N. Y. City; Mar. 18, '39; for liquid cleanser for cleaning rubber floors and mats, asphalt tile, etc.; use since Feb. 6, '39.

**Nos. 417,428-9.** Thodenol Soap Corp., N. Y. City; Mar. 25, '39; for liquid cleanser for cleaning rubber floors and mats, asphalt tile, etc.; use since Feb. 6, '39.

**No. 417,505.** Salvatore Rizzuto, N. Y. City; Mar. 25, '39; for preparation consisting of a chemical powder for extinguishing fire; use since Feb. 1, '37.

**No. 417,559.** Swan-Finch Oil Corp., N. Y. City; Mar. 27, '39; for lubricants; use since Nov. 27, '34.

**No. 417,952.** Atlas Powder Co., Wilmington, Del.; Apr. 7, '39; for flock coated paper or fabric commonly known as leather cloth; use since Feb. 23, '39.

**No. 417,970.** Frank G. Macaloon (New Chemical Products Co.), Washington, D. C.; Apr. 7, '39; for an insecticide; use since Feb. 15, '39.

**No. 418,154.** Julius E. Johnson (J. E. Johnson & Co.), Chicago, Ill.; Apr. 12, '39; for cleaning compound having incidental polishing properties; use since Dec. 1, '36.

**No. 418,256.** Merz & Co. Chemical Works, Inc., Newark, N. J.; Apr. 14, '39; for various chemical preparations; use since Mar. 14, '39.

**No. 418,282.** Cowles Detergent Co., Cleveland, O.; Apr. 5, '39; for fused alkali silicate; use since Mar. 7, '39.

**No. 418,373.** Stein, Hall Mfg. Co., Chicago, Ill.; Apr. 17, '39; for adhesives; use since October, '38.

**No. 418,339.** R. M. Hollingshead Corp., Camden, N. J.; Apr. 17, '39; for motor oils; use since October, '38.

**No. 418,532.** Purzone, Inc., Minneapolis, Minn.; Apr. 21, '39; for anti-freeze solutions for automobile radiators; use since Nov. 9, '38.

**No. 418,601.** F. Reinitz & Co., Inc., N. Y. and Long Island City, N. Y.; Apr. 22, '39; for soaps; use since Mar. 9, '39.

**No. 418,623.** Abbott Laboratories, No. Chicago, Ill.; Apr. 24, '39; for antiseptic soap, bath soap, liquid soap, soft soap, and soap for pet animals; use since May 13, 1931.

†Trademarks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, July 4 (Class 2 et sequ.) to Aug. 1, inclusive. See also next page.

ADVERTISING PAGES REMOVED

# New Trade Marks of the Month

### (*Trade Mark Descriptions Continued*)

**No. 418,653.** Smithereen Co., Chicago, Ill.; Apr. 24, '39; for preparation for exterminating rats and mice; use since 1888.

**No. 418,688.** Frank G. Macaloon (New Chemical Products Co.), Washington, D. C.; Apr. 25, '39; for an insecticide; use since Apr. 19, '39.

**No. 418,704.** Margaret Crosse, Los Angeles, Calif.; Apr. 26, '39; for substance for detoxicating, spreading, and rendering adhesive insecticides and fungicides used in agriculture; use since Feb. 1, '38.

**No. 418,749.** The Selig Co., Atlanta, Ga.; Apr. 26, '39; for insecticides; use since Nov. 16, '35.

**No. 418,750.** The Selig Co., Atlanta, Ga.; Apr. 26, '39; for insecticides; use since Jan. 1, '38.

**No. 418,770.** Charles Derby (Universal Utility Co.), Gloversville, N. Y.; Apr. 27, '39; for preparation for cleaning and polishing glass and the like; use since Apr. 14, '39.

**No. 418,784.** Miller Chemical & Fertilizer Corp., Baltimore, Md.; Apr. 27, '39; for sulfur, blue dust, spraying dusts and spreaders, insecticides and fungicides; use since May 1, '38.

**No. 418,989.** The Selig Co., Atlanta, Ga.; May 2, '39; for insecticides; use since Apr. 2, '34.

**No. 419,031.** Metaplast Corp., N. Y. City; May 3, '39; for chemical composition for applying metal coating to non-metallic surfaces; use since Nov. 18, '38.

**No. 419,071.** Brown Corp., Quebec, Canada; May 4, '39; for bleached or white wood pulps; use since Mar. 22,'39.

**No. 419,081.** Masury-Young Co., Charlestown, Mass.; May 4, '39; for cleaning preparation for unfinished floors, woodwork, and like surfaces; use since Nov. 10, '38.

**No. 419,082.** Masury-Young Co., Charlestown, Mass.; May 4, '39; for cleaning preparation having incidental polishing properties for floors, woodwork and like surfaces; use since Jan. 15, '38.

**No. 419,116.** Hercules Powder Co., Wilmington, Del.; May 5, '39; for dynamites; use since Apr. 12, '39.

**No. 419,139.** Biltmore Paper Co., Inc., N. Y. City; May 6, '39; for liquid floor wax; use since Feb. 20, '39.

**No. 419,154.** Peerless Carbon Black Co., Pittsburgh, Pa.; May 6, '39; for carbon black used in the manufacture of printing, lithographing, and stencil inks, and for carbon paper and typewriter ribbons; use since Jan. 25, '38.

**No. 419,162.** Sherwin-Williams Co., Cleveland, O.; May 6, '39; for paints, paint enamels, lacquers, japans, varnishes, stains, dry paint colors, white lead, paint pigments, and the like; use since Jan. 31, '39.

**No. 419,164.** C. L. Shorts, West Alexander, Pa.; May 6, '39; for liquid preparation for cleaning, and polishing precious gems, synthetic stones, glassware, windows, and mirrors; use since Apr. 20, '39.

**No. 419,193.** Geo. J. Kelly, Inc., Lynn, Mass.; May 8, '39; for liquid, paste, or cream shoe polishes, creams, dressings, self-shining liquid wax, and white shoe cleaner; use since Aug. 11, '38.

**No. 419,195.** National Chemical & Mfg. Co., Chicago, Ill.; May 8, '39; for paints in paste form; use since Jan. 1, '39.

**No. 419,196.** Francis R. Nichols (Edgol Co.), Baltimore, Md.; May 8, '39; for preservative oil for razor blades and the like; use since Nov. 26, '37.

**No. 419,276.** Harry Sheftel (Aywon Damproofing Co.), N. Y. City; May 10, '39; for chemical preparation to be used for damp-proofing brick walls; use since Aug. 7, '37.

**No. 419,288.** Armour and Co. of Delaware, Chicago, Ill.; May 11, '39; for granulated soap; use since Apr. 18, '39.

**No. 419,289.** Lois B. Beckwith, Manchester Ctr., Vt.; May 11, '39; for insecticides; use since Apr. 3, '39.

**No. 419,294.** The Curran Corp., Malden, Mass.; for solvent cleaner and degreasing compound, sold in concentrated form; use since 1933.

**No. 419,337.** Fisher Scientific Co., Pittsburgh, Pa.; May 12, '39; for electrical institute for quantitative and qualitative chemical analysis by means of the dropping mercury electrode system; use since May 1, '39.

**No. 419,368.** Ralph N. Chipman (Berako Co.), Bound Brook, N. J.; May 13, '39; for insecticides and fungicides; use since Feb. 23, '39.

**No. 419,427.** Kentucky Color & Chemical Co., Louisville, Ky.; May 15, '39; for insecticides; use since Mar. 22, '39.

**No. 419,459.** Vegetable Oil Prods. Co., Inc., Wilmington, Calif.; May 15, '39; for oils and greases for manufacturing paint; use since Jan. 24, '38.

**No. 419,511.** General Chemical Co., N. Y. City; May 17, '39; for detergent for cleaning metals, glass, painter surfaces, and for other household and industrial cleaning purposes; use since Apr. 5, '39.

**No. 419,529.** Scholler Bros., Inc., Philadelphia, Pa.; May 17, '39; for textile treating composition; use since May 10, '39.

**Nos. 419,550-1.** Derris, Inc., N. Y. City; May 18, '39; for insecticides; use since Apr. 5, '39.

**No. 419,575.** Huemite, Inc., Dayton, O.; May 19, '39; for insecticides; use since June 16, '36.

**No. 419,585.** The Mackwin Co., Winona, Minn.; May 19, '39; for an insecticide; use since May 1, '39.

**No. 419,554.** Gray Chemical Co., Roulette, Pa.; May 18, '39; for activated carbon made from wood; use since Aug. 29, '38.

**No. 419,561.** John Powell & Co., Inc., N. Y. City; May 18, '39; for series of oil soluble perfume oils; use since Apr. 21, '39.

**Nos. 419,683-84.** Plomocite Products, Inc., Denver, Colo.; May 22, '39; for cleansing powder sold in bulk for industrial use; use since Mar. 1, '39.

**No. 419,690.** Southport Petroleum Co., Kilgore, Tex.; May 22, '39; for gasoline; use since Jan. 24, '39.

**No. 419,715.** E. I. du Pont de Nemours and Co., Wilmington, Del.; May 23, '39; for cellulose acetate, plastics, cellulose film; cellulose nitrate plastics, clays, flint, fluorspar, methyl methacrylate molding powder, nitrocellulose, sponge rubber, powdered glass, pyrophyllite, pyrospar, quartz, resinous plastics, resins, silica, and talc; use since October, '23.

**No. 419,824.** Vegetable Oil Products Co., Inc., Wilmington, Calif.; May 25, '39; for oils and greases for use in the manufacture and composition of lubricating oils and greases; use since Nov. 29, '38.

**No. 419,862.** Fink-Roselieve Co., Inc., N. Y. City; May 26, '39; for photographic preparations; use since May 23, '39.

**No. 419,942.** Atlas Supply Co., Newark, N. J.; May 29, '39; for anti-freeze compound for automobiles; use since May 22, '39.

**No. 419,968.** J. M. Harris & Co., Roanoke, Va.; May 29, '39; for insecticides; use since May, 1935.

**No. 419,979.** Savogran Co., Boston, Mass.; May 29, '39; for paint and varnish remover; use since May 10, '39.

**No. 419,984.** Sterns, Ltd., London, England; May 29, '39; for heating and lubricating oils; use since June, 1906.

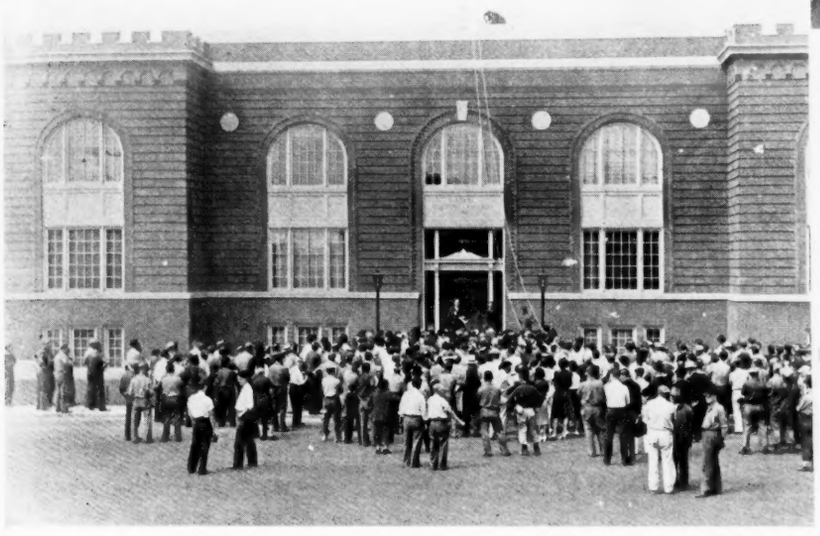
**No. 420,189.** Stein, Hall & Co., Inc., N. Y. City; June 5, '39; for locust bean gum; use since 1929.

**No. 420,455.** Hart Products Corp., N. Y. City; June 13, '39; for wetting and moistening preparations; for finishing, smoothing, and tanning preparations; and for fibre penetrating and protecting preparations; use since June 9, '38.

**No. 420,478.** I. G. Farbenindustrie Aktiengesellschaft, Frankfort-am-Main, Germany; June 14, '39; for artificial resins; use since June 24, '38.

# Hooker Dedication Party

On Sept. 15, between the hours of four and seven, the new main offices of Hooker Electrochemical at Niagara Falls, N. Y., were viewed by a large number of industrial executives and other prominent and important local and out-of-town figures. As the visitors entered the building they were greeted by R. W. Hooker, sales manager, who introduced them to H. M. Hooker, president; E. R. Bartlett, vice-president and L. A. Ward secretary.

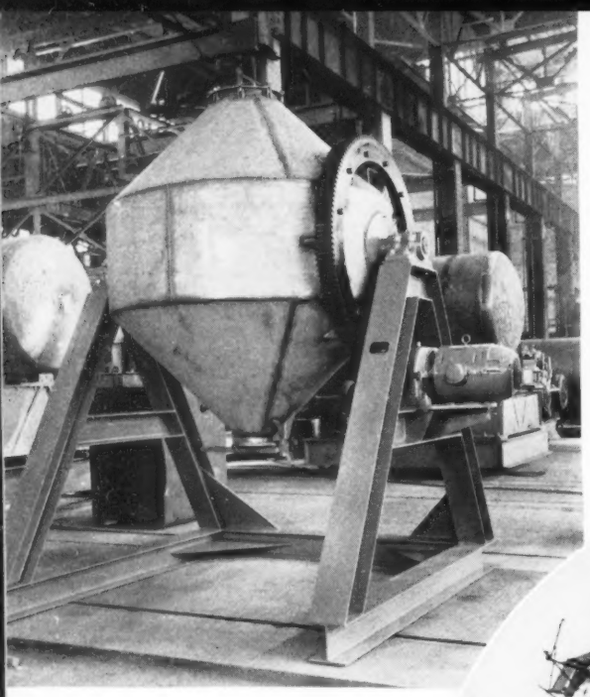


Particular interest was centered in the series of ten large mural paintings by Francis Scott Bradford, which adorn the main entrance lobby and which depict the rise of modern industrial civilization and the part played by chemistry in that development. These were the famous murals that adorned the former N. Y. City headquarters of the company.

A mecca for tourists, the new Corning Observatory Museum was erected through public subscription to serve as a repository for the original 200-inch telescope disc, world's largest piece of glass.

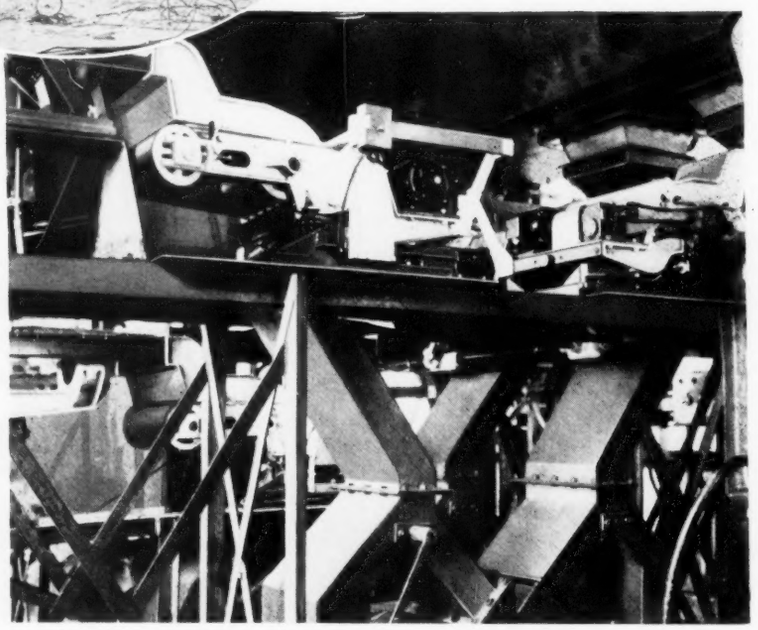
How modern chemical research and engineering play a leading role in the development of this nation's mighty sanitation projects and solve the problems of millions of people as well as a great many industries is strikingly portrayed by the opening of Chicago's Southwest Sewage Treatment Works. This is the world's largest mechanically equipped sludge plant. Dow Chemical's ferric chloride is being used as the coagulant.

# New in the Chemical Equipment Field

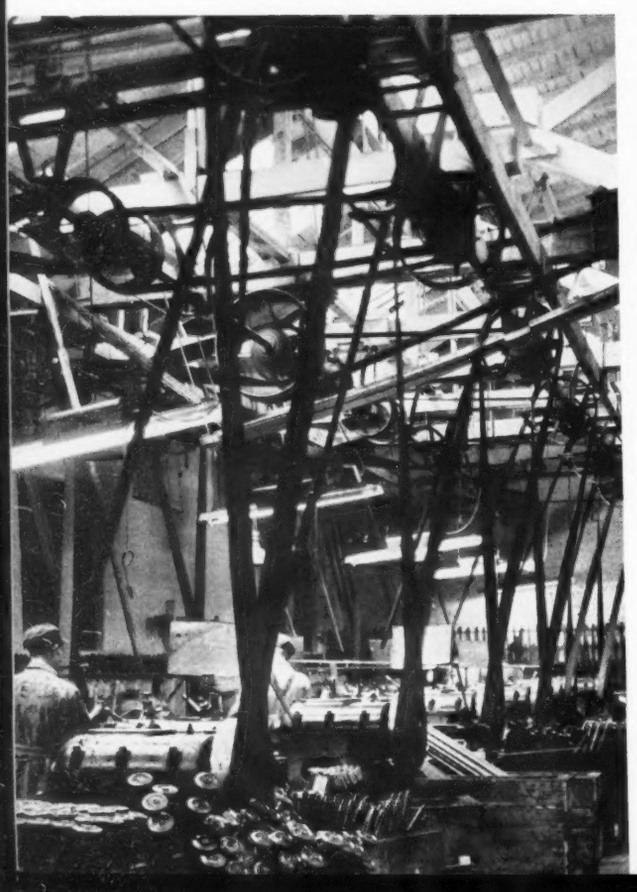


Uniformity in the "mix" has been the keynote objective in the development of a new blender for granular materials by Blaw-Knox, Pittsburgh. Blender is conical in form and rotation of the unit thus develops an appreciable degree of tossing action for the charge instead of a strictly rolling movement.

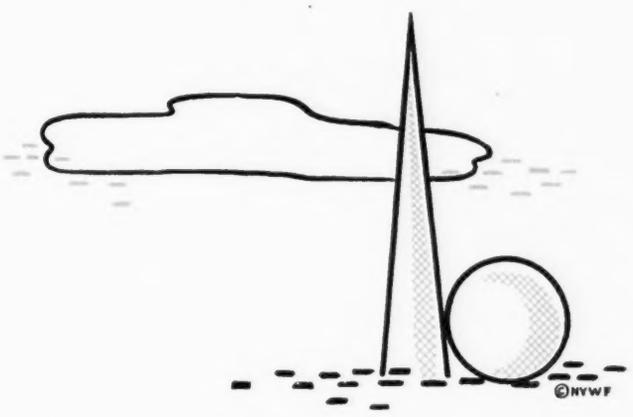
The Carboloy Company, Detroit, has installed a 33,760 cu. ft. sphere to store hydrogen gas for use in its furnaces in manufacturing tungsten-carbide for cutting tools. The giant metal ball is known as a Hortonsphere and permits a greater cubic content per pound of steel used than any other shape. To assemble this 40-foot ball, the Chicago Bridge and Iron Company used three G-E single-operator d-c arc welding machines and G-E, W22 electrodes.



Shown above are two No. 3-Jeffrey-Traylor constant-weight feeders, with their enclosures removed. They form a part of an installation in a glass plant, designed and erected by the Jeffrey-Traylor Division, The Jeffrey Mfg. Co., Columbus, O. Note the two-way chutes for automatic sampling of the batch ingredients being weighed out on the feeders at top of illustration.



After three years of research and experimentation, Hewitt Rubber, Buffalo, is now manufacturing an all-Neoprene Friction Surface Transmission Belt. This new product is the result of a demand for belting that will withstand the destructive action of mineral oils on the rubber friction compounds.




# *Chemicals of Today for*

## PROCESSES OF TOMORROW

Fourteen years of research and practice in the field of chlorination and alkylation—nation-wide experience in helping solve the chemical problems of industry — have developed the SHARPLES group of SYNTHETIC ORGANIC CHEMICALS.

While the following list is limited to products which are commercially available, intensive research has brought us in close contact with widely scattered industrial fields —and today there are more than 100 other SHARPLES chemicals in the semi-commercial or laboratory stage. It is not unlikely that one or more of these will be the nucleus around which a "PROCESS OF TOMORROW" may be built. The Sharples Laboratories and Development Staff are at all times ready and eager to work with research and industry.

SHARPLES TRADE MARK SOLVENTS

*Pentasol (Pure Amyl Alcohol)
*Pent-Acetate (100% Amyl)
Normal Butyl Carbinol
Isobutyl Carbinol
Sec-Butyl Carbinol
Diethyl Carbinol
Dimethyl Ethyl Carbinol
Tertiary Amyl Alcohol
*Pentaphen (p-Tertiary Amyl Phenol)
Diamyl Phenol
Ortho Amyl Phenol
Monoamylamine
Diamylamine

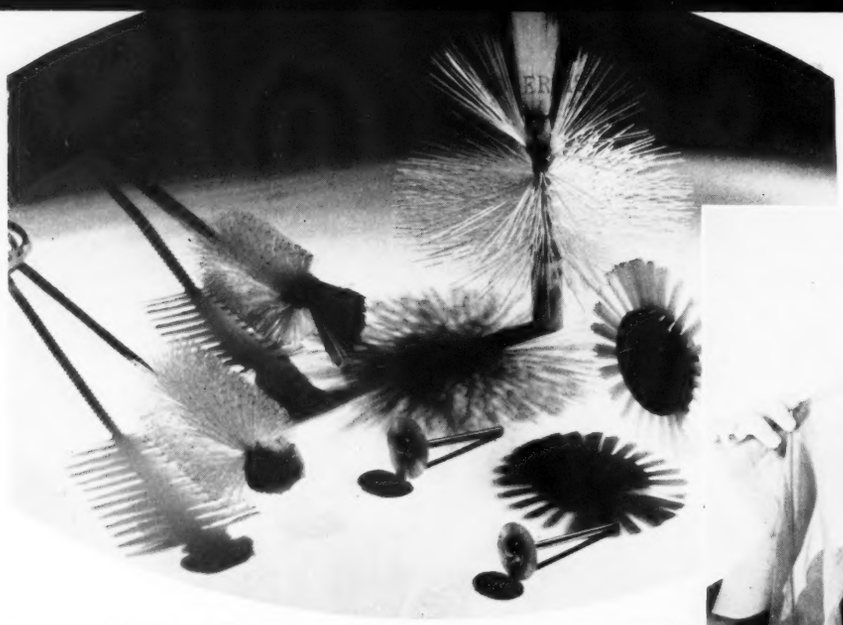
Triamylamine
n-Monobutylamine
n-Dibutylamine
n-Tributylamine
Monoethylamine
Diethylamine
Triethylamine
Monoamyl Naphthalene
Diamyl Naphthalene
Polyamyl Naphthalenes
Mixed Amyl Naphthalenes

Normal Amyl Chloride
Normal Butyl Chloride
Mixed Amyl Chlorides
Dichloropentanes
Amyl Mercaptan
Diamyl Sulphide
*Pentalarm
Amylenes
Diamylene
Amyl Benzenes
Diamyl Ether

SEMI-COMMERCIAL PRODUCTS
LABORATORY PRODUCTS
*Trade Mark Registered

THE SHARPLES SOLVENTS CORP.

PHILADELPHIA • • CHICAGO • • NEW YORK

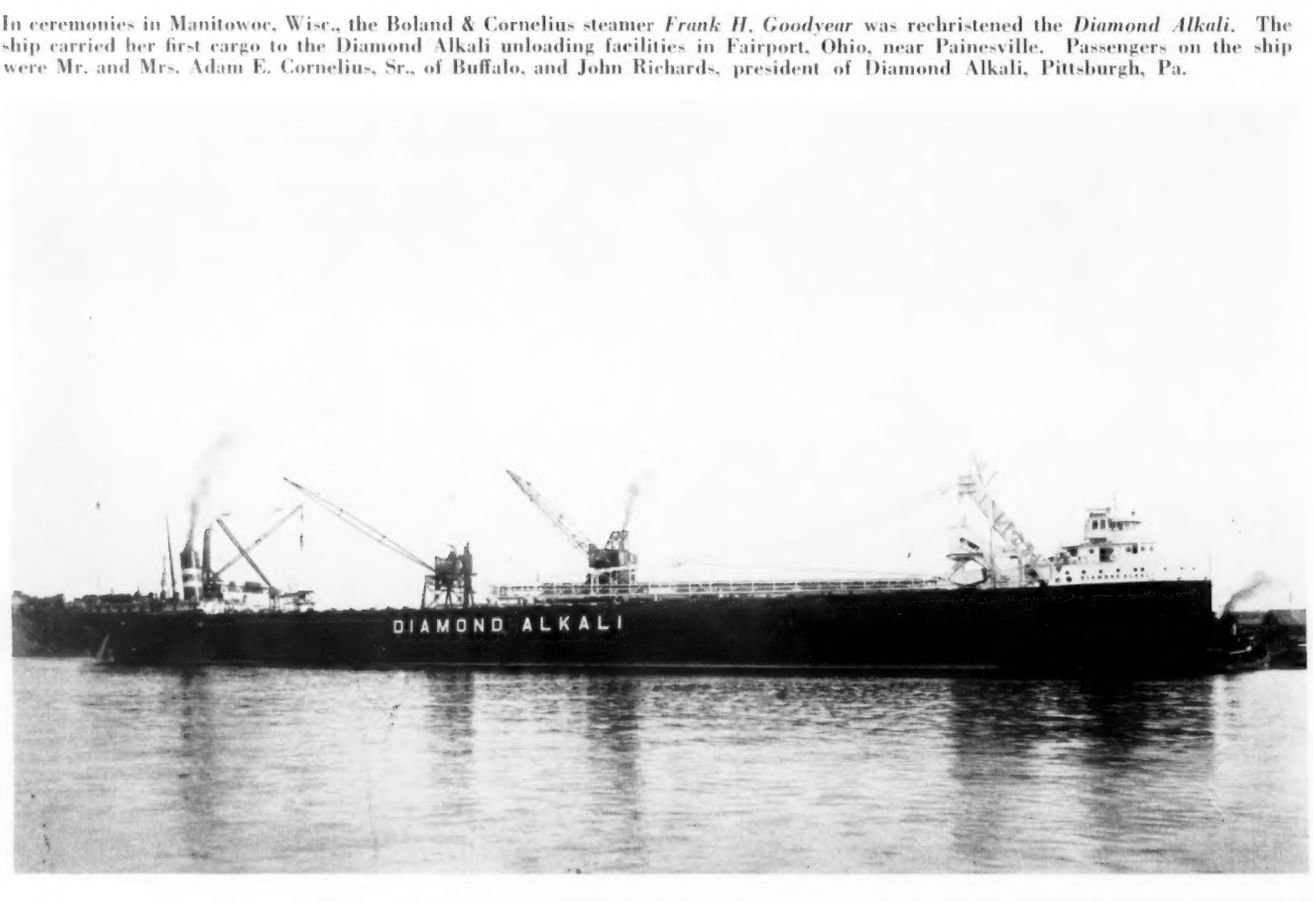


Bristling filament made of nylon, the new synthetic product developed by Du Pont, was recently adopted for bottle washing brushes used for high speed equipment, by Volckening, Inc., Brooklyn, N. Y. and C. Gerhardt of N. Y. City. A new economy is afforded in this adoption, it is said, because of a lower rate of replacement.

## Du Pont's New Nylon

This illustration demonstrates the sheerness of hosiery made of yarn spun from nylon, a protein-like material made from coal, air and water.

In ceremonies in Manitowoc, Wisc., the Boland & Cornelius steamer *Frank H. Goodyear* was rechristened the *Diamond Alkali*. The ship carried her first cargo to the Diamond Alkali unloading facilities in Fairport, Ohio, near Painesville. Passengers on the ship were Mr. and Mrs. Adam E. Cornelius, Sr., of Buffalo, and John Richards, president of Diamond Alkali, Pittsburgh, Pa.



# News Review of the Month

## PURCHASING HYSTERIA DECLINES

***Leading Chemical Companies Urge Consumers to Restrict Purchasing to Immediate Needs—Natural Raw Materials and Metal Salts Advanced Sharply—Present Situation Contrasted With 1914—Buyers Seek Information on '40 Chemical Contract Prices—***

HYSTERIA would be a mild description of the state of trading which followed the outbreak of hostilities abroad. Buyers sought to acquire sizable backlogs of materials, particularly natural raw materials. Overnight the buyers' market of long-standing turned into a strictly sellers' market. Purchasing agents soon found that it was useless to try and acquire extra stocks. Suppliers, almost without exception, reported that they would take care of the normal requirements of their regular customers but would not honor demands for special shipments. Many large chemical concerns issued reassuring statements.

**Monsanto Assures Trade**

Monsanto Chemical on Sept. 18 informed its 30,000 customers by letter that with few exceptions its present selling prices yield a fair profit and that it would not increase selling prices of its products even though there may be an opportunity to do so, unless there are sound reasons for such action, and that a review of the more important raw materials does not indicate any reason for a precipitous rise in their cost.

The statement also expressed the belief that there is ample installed capacity for all the products Monsanto manufactures to supply any normal domestic demands and a substantial share of export markets. The Monsanto letter follows:

"We have recently experienced an unusual demand for some of our products. This might reflect an anticipation of possible shortages or greatly increased prices.

"It is our belief that there exists ample installed capacity for all the products we manufacture to supply any normal domestic demands and a substantial share of export markets.

"With some exceptions, of which our customers must be cognizant, our selling prices yield a fair profit. It will be our policy not to increase such selling prices even though there may be opportunity to do so, unless there are sound reasons for such action.

"We have carefully reviewed our raw materials and in the case of most of the important ones we cannot now see any reason for a precipitous rise in their cost.

"In the unforeseen event of demands beyond our capacities, it will be our policy to provide first for our present customers regardless of other inducements that may be offered."

**Calco Compares '14 and '39**

Calco Chemical was another company to issue a formal statement. To each and every one of its customers the following letter was forwarded on Sept. 23:—

"In common with other manufacturers of dyestuffs and related chemicals, The Calco Chemical Company, Inc., Bound Brook, N. J., a Division of American Cyanamid Company, reports a recent rush of orders reminiscent of the exciting days of 1914 and 1915. This they view as a symptom of 'war jitters' which is unjustified in the light of today's conditions.

"They are employing both special bulletins and paid advertising to emphasize the vast difference between the situation then and now as regards the ability of American manufacturers to supply the country's full requirements for dyes and chemicals.

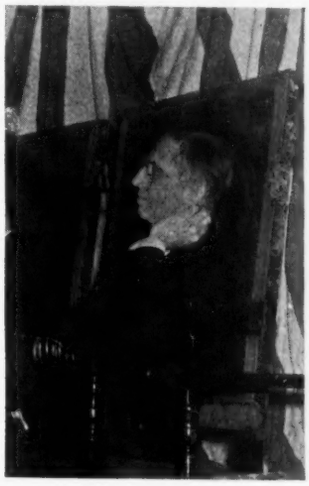
"In 1914, it is recalled, approximately 90% of the country's requirements were supplied by foreign sources. Since then, they point out, Calco has grown from an insignificant standing start to the point where they are now one of the country's largest producers of dyes, intermediates and related chemicals. Their production has not only increased tremendously in volume, but has become impressively diversified as well. They add that the progress of many other domestic companies has paralleled that of Calco, bringing present normal capacity to well over 90% of the country's entire needs.

"From this they reason that there is every likelihood that American firms can supply virtually every domestic requirement for dyes and chemicals—not only in quantity but in quality as well. They are therefore urging that orders be kept in pace with actual needs—both as a means of minimizing the spread of 'war jitters'—and as an aid in keeping manufacturing schedules at efficient, economical levels. They add a further assurance that not only do they see no danger of a general shortage similar to that of 1914, but that they are taking every means to assure users of protection in keeping prices within reasonable levels.

"In the event that unforeseen circumstances make such a course necessary, they indicate that preference in the filling of orders will be accorded to present customers."

**Dependent No Longer**

The self-sufficiency of American industry today in sharp contrast with dependence upon imports during the World War was emphasized by Lammot Du Pont, president of E. I. du Pont de Nemours & Company, in a statement on Sept. 12 to 800 Delawareans participating in Delaware Day at the World's Fair.



**LAMMOT Du PONT**

"Our chemical industry stands as a solid guarantee of our self-sufficiency."

Mr. Du Pont said that domestic chemical achievements in the last quarter of a century have given the country adequate quantities of nitrates extracted from the air, whereas the nation was almost completely dependent on the importation of natural nitrates from Chile in 1914; that practically all the industrial needs for

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COUNCIL ACCEPTED

# NICOTINIC ACID MERCK

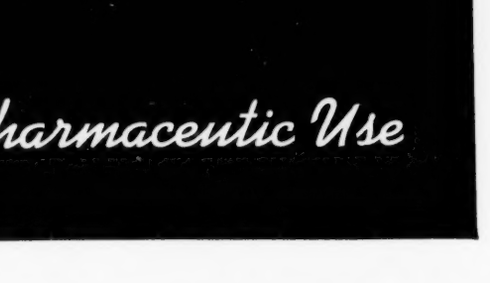
(Beta or 3: Pyridinecarboxylic Acid)

*Admirably Adapted to Pharmaceutic Use*

Current medical and scientific literature directs attention to the dramatic therapeutic results which have been obtained following the administration of Nicotinic Acid in the treatment of human pellagra, blacktongue in dogs, and nutritional disorders simulating pellagra in swine.

Suitable for both human and animal use, this pure crystalline vitamin meets the pharmaceutical manufacturer's most exacting requirements. It is soluble in water and alcohol, stable in air, non-hygroscopic, and may be autoclaved without loss of activity.

Other essential dietary factors available in pure crystalline form are: *Vitamin $B_1$ Merck Crystals, Riboflavin Merck,* and *Ascorbic Acid Merck.* We will welcome your inquiries for detailed information.




MERCK & CO. Inc. *Manufacturing Chemists* RAHWAY, N. J.

New York Philadelphia St. Louis *In Canada:* Merck & Co. Ltd., Montreal and Toronto

dyes now are being met domestically, whereas almost all supplies had to come from abroad during the last war; that dependence then upon Germany for potash has been ended by methods permitting recovery of potash from America's mineral deposits; and that neoprene, the chemical rubber, now serves as a substitute for natural rubber, being actually superior to natural rubber for many uses.

Mr. Du Pont asserted that these are only a few examples of the hundreds of accomplishments American chemists have achieved since the last Great War. He declared America's diversified chemical industry stands today as a solid guarantee of American self-sufficiency.

**No Price Rise in Citric**

Consumers of citric acid took heart at the announcement made by Chas. Pfizer & Co., that "as the largest producers of citric acid and citrates in the world, we wish to assure the consumers in the United States that this company will make no advance in the present prices for these products for at least one year from Oct. 1, 1939."

**Situation in Natural Resins**

Stroock & Wittenberg in its Sept. 27 issue of "Resin News" discussed in detail the situation in natural resins as follows:

"As in 1914, business today is faced with many problems which did not exist a few months ago. It is again becoming difficult to get at all the facts which constructive, long-range operation requires. Under such circumstances, markets are apt to be unusually sensitive to overbuying. It will be a stabilizing influence, therefore, if purchases can continue to be based on requirements rather than on the necessity for abnormal inventories, due to uncertainty.

"The supply of natural resins is just the same now as it was before Sept. 3; but the facilities for and dangers of transportation are different. The situation has been further aggravated by very heavy releases, which, coming all at once, have had a disturbing effect in the primary markets, just as they would have had even in normal times. As long as the sea lanes remain as open and protected as they are, there is no reason to believe that most shipments from abroad will not get through. Shipping will be decidedly more expensive and may take longer; but that should not too seriously affect the basic situation other than making it more necessary for requirements to be anticipated, with time to spare.

"There is ample capacity here for the production of synthetic resins: As a matter of fact we are in the process of materially increasing our own. Some raw materials entering into their manufacture are advancing; but here again many of the price increases have undoubtedly been due to abnormal and often unnecessary buying for inventory. The advance in rosin, for example, may have been due partly to that and partly to larger exports. On the whole, we see no reason, however, for any runaway synthetic resin markets.

"Our pricing policy will continue to be based on our cost, plus the reasonable and necessary margin to enable us to remain a reliable source of supply. In an emergency, our customers shall have the first call on our facilities, regardless of any other inducement. Obviously, the times demand a calm perspective and understanding cooperation."

A detailed study of the long list of price advances in the past 30 days indicates quite clearly that the overwhelming majority of them were in the natural raw materials group or were on derivatives of the metals. The price stability of the staple chemicals has been overlooked in the wave of hysteria. Near the month-end it became apparent that some degree of normalcy was returning. The big "If" now is what the contract prices for '40 will be. In view of the uncertainties prevailing it is likely that contract prices will be delayed beyond the usual time this year.

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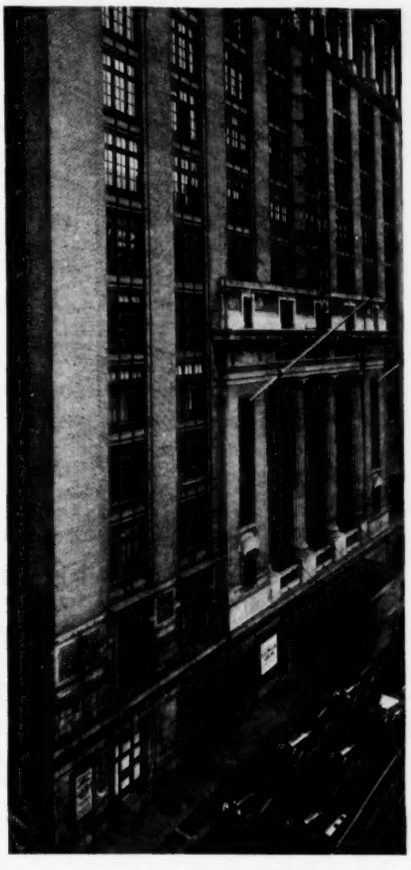
## Exposition Opens Dec. 4

Over 40 industries, producing chemical materials and equipment, will display their newest products at the 17th Exposition of Chemical Industries. The Exposition, for which nearly 300 exhibitors have already engaged space, will be held at Grand Central Palace during the week of December 4 to 9.



**Grand Central Palace will house 17th Exposition. "The New Chemicals For Industry" will be shown at Chemical Industries' booth.**

Chemical research, throughout all industries in the U. S. received its first big incentive in the crisis of the last World War. Under pressure, it established a world position which it has maintained ever since. Each year has brought new and greater achievements for the health, comfort, and safety of the world. The Exposition of Chemical Industries, established in 1915, has played an important part in this progress.

In addition to the chemical raw materials and manufactured products which will be exhibited at the Exposition, there will be many displays devoted to metals and alloys; also, to new synthetic plastics and their versatile applications. Plant machinery and equipment, applicable to each of the unit processes of chemical engineering, will also be shown.

Process equipment to be shown in operation will include units for crushing and grinding, flow of fluids, materials handling, filtration, drying, evaporation, and distillation. Other classifications of the Exposition will include containers and packaging machinery; instruments of precision; laboratory equipment and supplies; pumps, piping and steam process accessories; also, mill and factory supplies including refractories, cements, coating materials, packing supplies, fire extinguishing systems, factory wash fountains, safety equipment, etc.

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## Engineers Hear Brown

The N. Y. Section of the A. I. Ch. E. held its first meeting of the fall season at Keene's Chop House on Oct. 3. The principal speaker was the chemical consultant, C. O. Brown, formerly an executive with Chemical Construction Corp., and his subject was "The American Way Towards Communism." The discussion afterwards was led by Dr. B. T. Brooks, J. P. Hubbell and Walter Baëza.

The N. Y. Section will cooperate with Columbia University in the latter's celebration of the 75th anniversary of the founding of the College of Engineering by holding the November meeting of the Section at the University. Details of this meeting will be made available to members at a later date.

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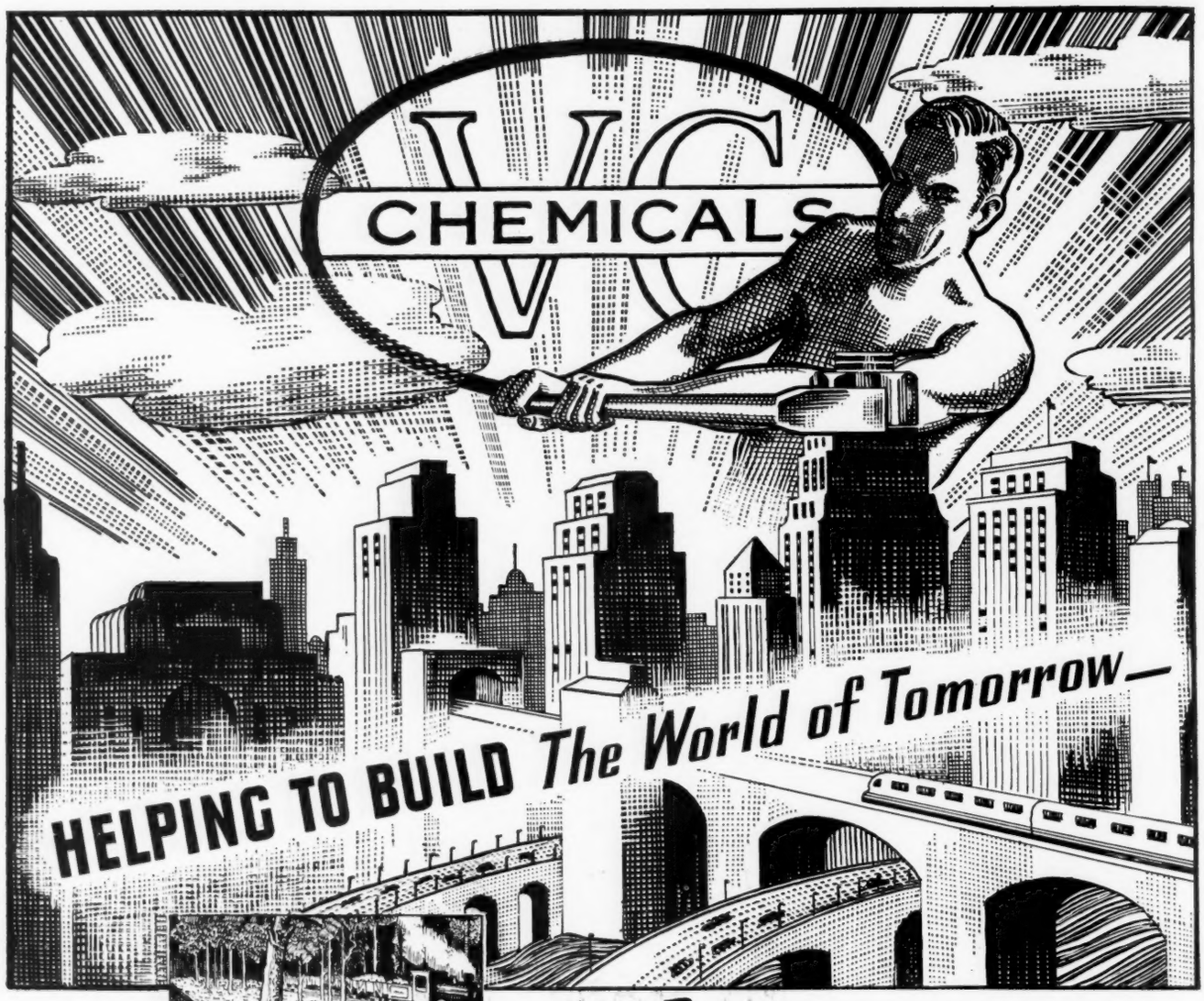
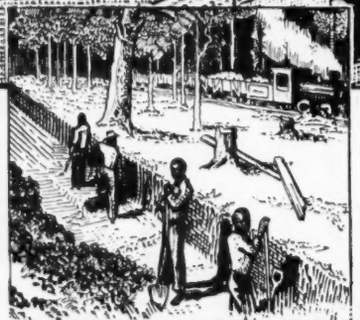
## Opens Detroit Branch

Monsanto's plastics department is establishing a branch office at Detroit, in the Union Guardian Bldg., under the direction of George C. Gress. He has been in charge of molding compound sales, with headquarters in company's offices at Springfield, Mass.




**In 1868-**

**V-C mined the first phosphate ores produced in this country, near Charleston, S. C.**



# FROM THE WORLD OF *Yesteryear!*

**PIONEERS IN THE PHOSPHATE FIELD . . .** The Virginia-Carolina Chemical Corporation, by its early production of this essential raw material from the Charleston ore beds, began a new chapter in the history of "Phosphorus Mirabilis." Today, richer mines are worked; and chemical uses of phosphates have broadened the industry. Census statistics reveal a 600% increase in PHOSPHORIC ACID—in the past ten years alone; and *broader roles are on the horizon.* . . . The Virginia-Carolina Chemical Corporation, with most adequate mining facilities, plants, warehouses, branch offices and technical personnel, is working hand in hand with Industry, *anticipating tomorrow's needs.* We produce *all grades* of Phosphoric Acid—and our technical staff and development laboratories are available to you for determining the adaptability of this beneficent acid to your processes.

**INHIBITED AGAINST CORROSION . . .**
V-C Phosphoric Acids are available inhibited to reduce the corrosion of iron by 98%.

V-C CHEMICALS

**SALES OFFICES:** Atlanta, Ga.; Baltimore, Md.; Carteret, N. J.; Charleston, S. C.; Cincinnati, Ohio; Columbia, S. C.; Greensboro, N. C.; Jackson, Miss.; Little Rock, Ark.; Memphis, Tenn.; Montgomery, Ala.; Norfolk, Va.; Orlando, Fla.; Richmond, Va.; Shreveport, La.; St. Louis, Mo.; Savannah, Ga.; Wilmington, N. C.

## VIRGINIA-CAROLINA CHEMICAL CORPORATION *Richmond, Virginia*

PHOSPHORIC ACIDS—CALCIUM PHOSPHATES—SODIUM PHOSPHATES—SULPHURIC ACID
SPECIAL PHOSPHATES AND COMPOUNDS . . . *Also distributors of heavy chemicals*

*Heavy Chemicals*

## Metal Salts Lead in Month's Price Advances

### Chemical Producers Assure Regular Customers That All Normal Demands for Shipments Will Be Met—Little Speculation Likely—Large Number of Export Inquiries Reported—

INDUSTRY'S response to the outbreak of hostilities abroad was a broad wave of hysterical buying or attempts to do so. Chemical manufacturers urged consumers not to become "panicky," and assured them that the normal requirements of all would be taken care of but that no unusual quantities would be shipped that obviously were to be hoarded or resold. A number of the large chemical producers issued statements to their customers stating in substance that only such price advances as were absolutely necessary because of higher raw material costs would be made.

This level-headed attitude of the producers had a great deal to do with restoring some degree of sanity to the chemical markets in the final week of the past month. Nevertheless, manufacturers are booked pretty solid over the final quarter. In many instances lucrative export business has been turned down because producers are of a mind to see that all legitimate demands made upon them by domestic consumers are met. Export inquiries continue to pour in at an ever-increasing rate, the majority of them coming from Latin American countries.

**Relatively Few Price Changes**

Despite all of the hysteria the number of price advances made in industrial chemicals was relatively small. Advancing metal markets were responsible for most of the increases. Of course, the copper salts and the tin derivatives were definitely higher. A general price increase was noted in the barium compounds and certain of the strontium salts were marked up sharply. Antimony metal closed out the month at the nominal price of 14c and many of its derivatives were unobtainable with prices strictly nominal.

Higher prices were reported for the relatively few industrial chemicals that have been regularly imported in sizable quantities, such as sodium silicofluoride, Glauber's Salt, sal ammoniac, etc. Prices on these items have been highly competitive and, with foreign sources shut off, domestic makers have much firmer price ideas.

Even products, such as acetic, which have been particularly weak for a long period are now extremely firm. While no advance was reported in acetic, producers are no longer shading prices.

Spot stocks of caustic are very difficult to obtain. No longer is there any surplus of chlorine to worry about—in fact the problem now is to see that all consumers get sufficient supplies without any interruptions. Bichromate manufacturers are booked ahead solidly and have had to restrict export shipments to some degree.

Because of the sudden shift from a buyers' to a sellers' market there have been an unusual number of inquiries made by consumers concerning 1940 contract prices. In most cases manufacturers have deferred action. Sudden cessation of hostilities abroad would change the picture quite considerably and there are some who still feel that the European War will be of short duration. However, the majority of buyers are basing their calculations on the supposition that the Allies will not accept any terms offered at this time by Hitler. Several leading chemical producers have publicly stated that they will not take advantage of the present situation and raise prices willy-nilly just to swell profits. War does, however, mean higher raw material costs, labor costs, transportation costs, and inevitably higher quotations. These may not come in the majority of cases right away, but may be forced on producers in the second half of '40.

**Important Price Changes**

| | Sept. 30 | Aug. 31 |
|---|---|---|
| **ADVANCED** | | |
| Ammonium silicofluoride | $0.09 | $0.08½ |
| Antimony, metal | .14 | .12 |
| oxide | .12 | .10 |
| Barium carbonate, nat. 90% | 45.00 | 41.00 |
| 99% | 47.00 | 43.00 |
| Barium chlorate | .19 | .16½ |
| Barium hydrate | .05 | .04½ |
| Barium nitrate | .10½ | .06¾ |
| Calcium acetate | 1.75 | 1.65 |
| Copper carbonate | .16½ | .14 |
| Copper chloride | .16 | .12½ |
| Copper nitrate | .17 | .148 |
| Copper sulfate | 4.60 | 4.25 |
| Copper oxide, black | .18½ | .15 |
| red | .18 | .15¾ |
| Lead acetate | .11 | .10 |
| Manganese dioxide | 57.50 | 47.50 |
| Potassium metabisulfite | .16 | .11 |
| Sodium antimoniate | .16 | .11½ |
| Sodium silicofluoride | .04¼ | .04 |
| Strontium carbonate, tech. | .21 | .16½ |
| Strontium chloride | .15 | .11 |
| Tin, metal | .60 | .49 |
| Tin, crystals | nominal | .38 |
| Tin, oxide | nominal | .52 |
| Tin, tetrachloride | .30 | .24 |
| **DECLINED** | | |
| Acid hydrofluoric, 30% | $0.06 | $0.07 |

### The Story of Diesel

The story of Rudolf Diesel and the remarkable engine which bears his name is told in the October issue of *Priorities*, house-organ of Prior Chemical Corp., N. Y. City. The principle of the Diesel operation, how young Diesel conceived the idea of it and the extraordinary efficiency of his engine are briefly outlined in the simple language of the layman customarily employed in the Prior publication. A feature of the story that will surprise many is the explanation given of the source of the economy of the Diesel, generally but wrongly, thought to be due to the use of fuel oil.

### Survey of Lime Industries

A drastic decline in the number of small lime plants, sensitiveness to booms and depressions of the largest plants, and relative stability and constancy of output of medium-sized plants are outstanding features of a survey of the lime industry recently completed by the Bureau of Mines. This survey, based on the records of individual companies since 1910, illustrates with graphs changes in the number of companies, the number of plants and kilns, and their output and capacity. Further details of this survey are given in Information Circular 7088, "A Graphic Survey of the Lime Industry, 1910-38," by Oliver Bowles and A. T. Coons, copies of which may be obtained on request addressed to the Bureau of Mines, Washington, D. C.

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## *New Construction*

Du Pont is to increase by 25% the "Nylon" plant's capacity. New unit, now under way at Seaford, Del., will probably be finished by the first of the year. It is reported that Du Pont's engineering department will start to design a second "Nylon" unit, also to be erected at Seaford.

Hooker Electrochemical Co. is to erect a new chlorinator building at the Niagara Falls works. New unit follows the completion of the headquarters offices, transferred recently from N. Y. City, which were opened last month. The "housewarming" of the new central office building is reported on in this issue of CHEMICAL INDUSTRIES, p. 435 of the "Roto."

General Chemical Co., N. Y. City, has purchased a plot of buildings, 337' by 273', in Kalamazoo, Mich. General is to use this plant as the nucleus of a paper makers' division to serve the southern Michigan territory.

Victor Chemical Works is said to be building 2 additional furnaces at its Mt. Pleasant, Tenn., plant; when completed, company's output of elemental phosphorus will thereby be trebled.

### New Toledo Firm

The Royal Chem. Co., Toledo, O., was incorporated in September. New firm will engage in the manufacture of chemicals. Details of the organization have not yet been disclosed.

**ACIDS:** Phenol . Ortho Cresol . Cresol U.S.P. Cresylic Acid . Meta Para Cresol . Xylenol . High Boiling Tar Acids

**SPECIAL PRODUCTS:** Carbon Coke . Coal Tar Paints . Coal Tar Pitch Bituvia Road Tar . Flotation Oils . Pipe Coating Transote . Roofing Felt Pitch and Tar

**CHEMICALS:** Acenaphthene . Anthracene . Carbazole . Fluorene . Methyl Naphthalene . Phenanthrene . Naphthalene

**OILS:** Neutral Oil . Tar Acid Oil . Light Oil Creosote Oil . Coal Tar Oil . Brushing Oil

**INDUR PLASTICS:** Insulating Varnish . Laminating Varnish . Molding Powder . Molding Resin

REILLY TAR & CHEMICAL CORPORATION

*Executive Offices: Merchants Bank Building, Indianapolis, Indiana*

2513 S. DAMEN AVENUE, CHICAGO, ILLINOIS 500 FIFTH AVENUE, NEW YORK, N. Y. ST. LOUIS PARK, MINNEAPOLIS, MINN.

*FIFTEEN · PLANTS · TO · SERVE · YOU*

*Coal-Tar Chemicals*

## Price Stability Features Dyes, Intermediates

**Domestic Makers Advance Cresylic—Shortage of Benzol Feared—Good Demand for Solvents—Phenol Shipments Heavy—Coking Figures Gain—Crude Naphthalene Scarce—**

ONCE again the coal-tar chemical group has displayed its well-known reputation for price stability. Despite the sudden buying demands created by the start of a major European War, the number of price changes were relatively few—much fewer than in any other single division of the chemical manufacturing industry.

Those importers who had stocks of cresylic available early in the month first raised quotations sharply and then when these stocks were exhausted withdrew from the market entirely. Because of the extreme degree of price competition that has existed between importers and domestic producers of cresylic for months it was hardly unexpected when makers here raised quotations. They are taking care of the normal requirements of regular customers, but appear to be cautious in accepting new business.

Importers of crude naphthalene are unable to arrange definite deliveries and, as a result, the domestic product is now in a much firmer price position. At the moment there does not appear to be any serious shortage of the item, but consumers are slightly worried over what developments may take place around the first of the year.

**Heavy Solvent Shipments**

Fortunately, steel production is rising rapidly and with it, of course, coking operations. Despite this sizable increase, however, serious shortages of benzol, toluol, xylol, and coal-tar naphthas are anticipated. Current output of benzol, for example, is just about sufficient to take care of consumers under contract and leaves no surplus for spot sales. The same situation is practically duplicated in the markets for toluol. Spot lots of xylol were still available at the month-end, but were being taken up rapidly. The producers of coatings for the automotive field are expanding operations very rapidly and their demands for solvents have been heavy over the last few weeks.

The synthetic resin and plastic fields are currently taking large quantities of phenol. There is also a large demand for export which is only being partially filled at the present time. The weakness which has characterized the price structure of phenol has pretty much disappeared under the stress of the current wave of buying hysteria.

The indecision in the markets for synthetic dyes late in August ended early in the past month when producers announced a continuation of prices for the final quarter. There was an immediate rush of buying which is likely to be sustained on the theory that quotations for the first quarter of '40 may be higher. Shipments of intermediates and coal-tar acids were in excellent volume in the last 30 days.

**Important Price Changes**

**ADVANCED**

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Acid cresylic, H. B. ..... | $0.58 | $0.49 |
| L. B. ..... | .58 | .55 |

**DECLINED**

None

Light oil production in August totalled 14,805,021 gals., compared with 13,580,286 gals. in July and with but 10,284,559 in August of '38. Output for the first 8 months of this year amounted to 102,196,580 gals., against 80,022,837 gals. in the corresponding period of last year. Tar output in August reached 44,881,061 gals., as compared with 41,208,211 in the preceding month and 31,312,515 gals. in the corresponding month a year ago. For the first 8 months production totalled 309,805,716 gals., contrasted with but 243,643,417 gals. in the like period a year ago.

Corresponding with the increased output in August of other by-product chemicals, benzol production in August came to 8,797,000 gals., as compared with 8,028,000 in July and with 5,585,000 gals. in the like '38 month.

### Calco Raises Wages

The Calco Chemical Company, Inc., Bound Brook, N. J., announced a 5% increase in the pay of all hourly paid employees. Effective Sept. 17, the increase affects approximately 1,900 workers.

### New Dow Plant Operating

The largest plant in the world exclusively devoted to the manufacture of a versatile plastic material used by manufacturers of coatings, films and plastics is now in operation in Midland, Mich., according to information just released by The Dow Chemical Company. This new plant produces "Ethofoil," a clear glossy sheet material used for window packages, display containers for food stuffs and other commodities—and "Ethocel," which finds a wide utility in molding plastics, lacquers and other applications.

### Coaltar Color Regulations

Secretary of Agriculture Henry A. Wallace issued a finding Sept. 18, stating that an emergency exists requiring that the new coaltar color regulations become effective immediately, instead of 90 days hence. The regulations in question are virtually identical as were published in advance of hearings in July, and add 31 new colors to the certifiable list, as well as making a number of changes on the original list. No objections were registered at the July hearings. The Food & Drug Administration plans to schedule hearings in the near future on additional amendments for easing the restrictions and adjust the certification fees for small batches of coaltar colors for household use.

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## *Personnel*

**¶ H. B. du Pont Elected a Vice-President—E. V. Finch Heads Michigan's Sales—Others in New Positions—**

Henry B. du Pont, who has been assistant to the president of the Du Pont Company as well as a director, was elected in September a vice-president and a member of the executive committee. He is a graduate of Yale and M. I. T., and was formerly in charge of the engineering department's technical division. In July of last year, he became assistant to president Lammot du Pont.

Ernest V. Finch was last month appointed executive in charge of Michigan Alkali sales, in the company's N. Y. City headquarters. He is well known in the alkali trade, being president of the U. S. Alkali Export Association.

Dr. Robert D. Coghill, formerly assistant professor of chemistry at Yale, has been appointed chief of the fermentation division, Northern Regional Research Laboratory, Peoria, Ill.

V. C. Williams has been appointed assistant professor of Chemical Engineering at the University of Virginia. Mr. Williams has been a chemical engineer for the Linde Air Products Company, Buffalo, and has been actively engaged in design and process development work. He will assist in the development and teaching of the courses in chemical engineering thermodynamics, process development and plant design, and general laboratory work.

**Hercules Changes**

A. S. Kloss, formerly manager of Hercules Powder's Georgia Naval Stores Operations, has been transferred to the Operating Department of the Wilmington Naval Stores office. Reginald Rockwell has been appointed to Mr. Kloss's former post. George E. Bosserdet, formerly a supervisor of company's Hattiesburg, Miss., naval stores plant, is now in charge of its Brunswick, Ga., plant where Mr. Rockwell was formerly superintendent.

# News of the Specialties

## ¶Record Crowd to Attend National Pest Control Meeting in New York City, October 23-25 — Insecticide Makers Plan 25th Anniversary Meeting in Washington, December 4-5—

The National Pest Control Association will hold its 7th annual convention at Hotel Pennsylvania, N. Y. City, Oct. 23-25. Over 400 are expected to attend, making it the largest gathering in the history of the Association. Manufacturers have reserved 37 booths in which to display the recent developments in products of special interest to the pest control industry. At the general meeting on Monday morning, Oct. 23, Mayor LaGuardia will welcome the delegates and H. G. Irving Sameth will give the annual presidential address. Assistant Surgeon General C. L. Williams, U. S. P. H., will speak in the afternoon on "Analysis of Accidents and Precautions to be Observed." Following this, B. W. Eldridge will conduct a "Fumigation Clinic." Tuesday, Oct. 24, will be devoted to pests and pest control problems. On the final morning of the convention, new officers and directors for 1939-40 will be elected. In the afternoon, Ira P. MacNair, secretary of the N. A. I. D. M., will speak on "Picking Up the Trend Since the Cleveland Convention in 1936."

### N.A.I.D.M. in Washington

The silver anniversary meeting of the National Association of Insecticide and Disinfectant Manufacturers will be held Dec. 4 and 5 at the Mayflower, Washington, D. C. The general convention committee is headed by W. J. Zick, Stanco Distributors, N. Y. City. James Lovell, American Can, Baltimore, is in charge of the entertainment plans. C. L. Weirich, The C. B. Dolge Co., Westport, Conn., is chairman of the program committee.

### Suggested Formulae Listed

The National Bureau of Standards has issued Circular C383, entitled "Washing, Cleaning, and Polishing Materials." The 60-page booklet summarizes much useful information relating to every-day problems confronting the manufacturer and user of sanitary chemicals. It is a practical manual, and includes many suggested formulae for special requirements, supplementing the previously issued Circular No. 62 on "Soap." Circular C383 is available from the Superintendent of Documents, Washington, D. C., at 15c.

### Valuable Insecticide Booklets

General Chemical Co., N. Y. City, has brought out 2 pamphlets, one dealing with peach tree borer control, the other with the extermination of the Japanese and Asiatic beetles. These are part of a series supplementing the booklet, entitled "A Working Knowledge of Insecticides and Fungicides," issued by General several months ago.

### New Synthetic Waxes

The Beacon Co., Boston, has published a booklet, "60 New Synthetic Waxes," offering 5 groups of synthetic wax formulae with highly diversified properties, so that the various possible needs of the wax-consuming trades can be covered as completely as possible.

### Personnel Changes Reported

Dr. Leslie R. Bacon has accepted a position as research leader in the research organizatition of the J. B. Ford Company, manufacturers and distributors of detergents, cleaners and sanitary chemicals. Dr. Bacon for 12 years past has been with the research departments of the American Doucil and Philadelphia Quartz Companies, specializing in physical, chemical and colloidal problems relating particularly to ion-exchange, phase rule, silicate chemistry and detergency.

Paul W. Soderberg, formerly with Procter and Gamble and lately in charge of the chemical activities of the J. B. Ford Company, has been advanced to the position of manager of technical sales-service.

Dr. M. M. Beckwith, formerly chief chemist with the Guide Lamp Division of General Motors, is now a technical representative in the Industrial Cleaners Department of J. B. Ford Sales.

E. B. Wheeler and Thomas J. Hall have joined the sales staff of Carolina Aniline & Extract Co., Charlotte, N. C. Mr. Wheeler is in charge of the firm's newly-organized department specializing in the chemical phases of silk and rayon soaking, and Mr. Hall is directing the dyeing and finishing service department.

J. V. McCombs is now representing Quaker Chem. Products Corp., Conshohocken, Pa., in Georgia and South Carolina. He has been connected with the dyeing and finishing industry in the South for many years.

Albert A. Miesem, formerly treasurer and sales manager, Roxalin Flexible Lacquer Co., Elizabeth, N. J., was promoted early last month to vice-president in charge of sales.

James W. Hensley and Anton Vittone, Jr., with masters' degrees this year from the Universities of Colorado and Washington respectively, have joined the staff of J. B. Ford.

### Sunny-Sol Moves

The Sunny-Sol Co., manufacturer of laundry chemicals, has just moved from Le Roy, N. Y., to Caledonia, N. Y.; company will occupy a newly-constructed plant, manufacturing both laundry chemicals and specialties for the dairy industry.

### New Producer

McClain Laboratories, Morgantown, W. Va., has been formed to manufacture chemicals, drugs, and cosmetics.

The Savogran Company, Boston, introduces "Strypeeze," a new semi-paste remover produced especially for removing bakelite and synthetic resin types of finish as well as paint, varnish, enamel, shellac and lacquer. Contains no benzol, no alkali, no acid—is harmless to hands.

ADVERTISEMENT—*This entire page is a paid advertisement.* *Prepared Monthly by U. S. Industrial Chemicals, Inc.*

# SOLVENT NEWS

*Reg. U.S. Pat. Off.*

October ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1939

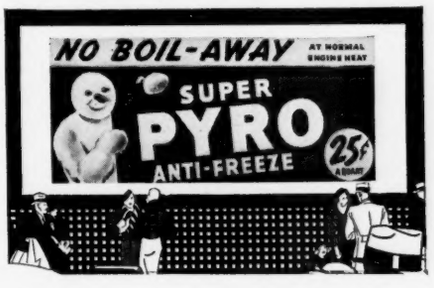
## Advertising of Super Pyro Anti-Freeze to Stress No Boil-away

### U.S.I.'s 1939-40 Campaign Features Low Cost of Anti-Freeze Protection

### Magazines and Posters Used

Scientific tests and nationwide surveys conducted last winter furnish the basis for the 1939 anti-freeze campaign for SUPER PYRO, the superior quality anti-freeze manufactured by U. S. Industrial Chemicals, Inc. Through the leading weekly national magazines and striking billboards in the important anti-freeze centers, U.S.I. will broadcast its story to over 20,000,000 motorists.

Major points in the advertisements, which emphasize that SUPER PYRO offers "an easy,




reliable way to get complete all-winter protection at low cost," are "no boil-away" and "no cracked blocks."

Tests prove that SUPER PYRO will not boil away under normal driving conditions in the modern car, since thermostatic temperature control keeps the engine heat between 155° and 160°. A solution of SUPER PYRO, sufficient to protect to 10 below zero, does not boil even at 185° F. Furthermore, by preventing rust and corrosion, the SUPER PYRO solution is itself protection against over-heating.

Among the thousands of SUPER PYRO users interviewed in a nationwide survey, not a single one reported a freeze-up. Scientific laboratory tests explain why. When motors containing as little as 15% of SUPER PYRO were exposed to extreme sub-zero temperatures, there was no solid freeze of the cooling solution.

Investigations further showed that with SUPER PYRO at a retail price of $1.00 a gallon (25c per quart) 84% of SUPER PYRO users paid less than $2.00 for all-winter protection as against more than $5.00 which a motorist

(*Continued on next page*)

## Compares Marine Paints

LONDON, England—A study of nearly 50 anti-fouling and anti-corrosion paints for marine service has been completed by the Royal Aircraft Establishment here.

Marine exposure with these proprietary algicides over standard paints was generally disappointing for aircraft use. Much more satisfactory results were said to be obtained by adding one part by weight of equal quantities of zinc oxide and copper arsenate to two parts of seaplane varnish.

Results of the algicides tested also varied widely according to the type of priming coat and the metal beneath it.

## Ansol M Used in Greater Quantities As Deep-Etching Process Expands

### Low Cost, High Solvent Power Contribute to Popularity of This U.S.I. Anhydrous Solvent In Many Other Applications

Rapid rise in the popularity of the deep-etched process of lithography in the last few years has brought about an increasing use of U.S.I.'s anhydrous denatured alcohol solvent, Ansol M.

In this process, the presence of any water in the etching solution has a deleterious effect, and the use of an anhydrous alcohol solvent is essential to success. No water should touch the plate from the time the dichromated gum coating is applied until after application of the shellac etching resist, and the plate is ready for removal of the gum image. The Lithographic Technical Foundation in its research bulletin No. 10 advises that U.S.I.'s Ansol M gives entirely satisfactory results for this purpose.

#### Advantages of Ansol M

While deep-etched lithography forms one of the newer applications for Ansol M, it is only one of the many cases in which this solvent has marked advantages. A major point in comparison with anhydrous denatured alcohol is that its use for solvent or manufacturing purposes is not subject to permit restrictions.

Essentially an anhydrous denatured alcohol to which small amounts of ester and hydrocarbon have been added, Ansol M compares very favorably in price with anhydrous denatured alcohol. Originally developed by U.S.I. for use in the manufacture of nitrocellulose lacquers, its field of usefulness has been broadened to include almost every type of work which requires an anhydrous alcohol type solvent, and in which the small amount of denaturants present is not a drawback.

#### Greater Solvent Power

In many solvent applications, the minor additions of ester and hydrocarbons in Ansol M result in substantially increased solvent power. Many of the natural gums and resins which are either insoluble or only slightly soluble in alcohol are appreciably soluble in Ansol M after a simple pretreatment. Among the Damar gums, for example, Batu, Black and Pale East India Macassar show noticeable solubility in Ansol M after a treatment which consists of merely drying the gum to remove the small amount of moisture present. Ansol M is also a

(*Continued on next page*)

**In preparing the plate for the press in the increasingly popular deep-etched lithographic process, it is important that water be kept away from the plate. An anhydrous denatured alcohol solvent of the type of Ansol M is highly satisfactory for use in the etching solution.**

## *Treated Tung Oil Dries Quickly to Clear Film*

LAKEWOOD, O.—How tung oil can be chemically treated to yield a clear, hard film without sacrifice of drying properties is disclosed in a patent issued to an inventor here.

Process consists in treating the oil with selenium or other chemicals, and then extracting the chemicals by suitable solvents. Choice of solvents is very important, according to the inventor, who has found a mixture of aliphatic alcohols satisfactory for the purpose. One suggested mixture consists of 90% amyl alcohol and 10% ethyl alcohol.

The inventor claims that the addition of the chemicals tends to inhibit heat gelation of the tung oil, while the subsequent extraction retains the quick-drying properties.

**A handy reference chart for mixtures of ethyl alcohol and water gives boiling points, dew points, freezing points and composition of co-existing phases for percentages of alcohol from zero to 100. Copies of this chart may be secured free of charge by writing U. S. I. Ask for Bulletin AW.**

## Dibutyl Phthalate Ups Paper Shades' Eye Value

NEWBURGH, N. Y.—Dibutyl phthalate is one of the ingredients in a new composition for preparing paper window shades that transmit light uniformly, it is set forth in a patent issued to an inventor here.

Although there has long been a demand for paper window shades, those previously made have lacked "eye value," according to the inventor of the new process. By applying several coats of a composition consisting of

| | |
|---|---|
| Cellulose nitrate | 30.8% |
| Dibutyl phthalate | 23.0% |
| Leaded zinc oxide | 46.2% |

to a paper base material, a shade can be produced which gives the effect of a coated or impregnated woven fabric, it is claimed. Other compositions are suggested for producing colored shades.

**Dibutyl phthalate is produced by U.S.I.**

## Soy Bean Acreage at High

WASHINGTON, D. C.—The 8,119,000 acre crop of soy beans planted this year is the largest on record, reports the Federal Crop Reporting Board here.

The 1938 area was 6,058,000 acres and the 1928-1937 average 4,246,000 acres. Of the 1939 increase, four-fifths was in Illinois, Ohio and Indiana. Illinois is the largest soy bean producing state, with 2,452,000 acres under cultivation.

ADVERTISEMENT—*This entire page is a paid advertisement.*

October ★ **SOLVENT NEWS** ★ 1939

## Red Light Flashes Warning Of Dangerous Gases

CHICAGO, Ill.—A simple monitoring device can be arranged to signal the presence of dangerous gases, it is announced by a manufacturer here. Blue light burns on case when sample is normal. If a dangerous gas is found, the blue light goes out and a red light flashes on. At the same time, a relay closes which can be used to operate other electrical circuits.

Applications for the detector are reported to include checking for the presence of oxygen — as a safeguard against explosions and fires — or for the presence of chlorine or other objectionable gases, depending on adjustment of instrument.

## *Synthetic Rubbers Classified*

A complete classification of synthetic rubbers and rubber-like substances is contained in a recent technical article by Dr. Harry L. Fisher, of the U. S. Industrial Alcohol Co. The article outlines the history of these substances, and discusses recent and new terms used in their nomenclature.

U.S.I. will be glad to supply readers with reprints of the article. Ask for Bulletin SR.

## Super Pyro's 1939 Campaign

(*Continued from previous page*)

would have to pay if an expensive brand of anti-freeze were used.

Dealer prices for SUPER PYRO will be standard throughout every section of the country—54c per gallon on large drums, 60c on the 5-gallon and 1-gallon cans, and 65c on the quart cans.

U.S.I. continues its policy of consigning stocks of SUPER PYRO to carefully selected distributors whose compensation for selling provides 25% return on 54-gallon and 5-gallon drums and quart cans on volume exceeding 4,000 gallons.

The force of the advertising campaign behind SUPER PYRO for this winter, coupled with the satisfactory experience of over 19,000,000 who have already used the product is expected to set new records for SUPER PYRO popularity.

## Cost, Solvent Power, Factors In Ansol M's Growing Use

(*Continued from previous page*)

solvent for alcohol-soluble nitrocellulose and for ethyl cellulose.

From the following specifications it will be seen why this solvent is widely used in the manufacture of lacquers, lacquer thinners, spirit varnishes, and dopes for airplane fabrics, leather, and artificial leather.

SPECIFICATIONS FOR ANSOL M

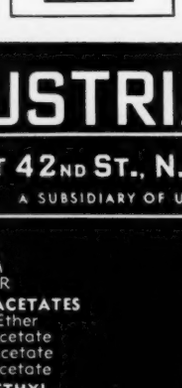
ACIDITY
Free acid as acetic, not more than 0.02%
COLOR Water-white
DISTILLATION RANGE
Below 70° C.....None
Below 80° C.....Not less than 90%
Above 90° C.....None
DRYNESS
Miscible without turbidity with 20 vols. 60° Bé. gasoline at 20° C.
NON-VOLATILE MATTER
Not more than 0.003 gm. per 100 cc.
ODOR
Mild, non-residual
SPECIFIC GRAVITY
At 20°/20° C.....0.796—0.800

When substituted for 95% alcohol in lacquers, it has the effect of reducing the tendency to blush, and therefore permits the use of smaller amounts of high-boiling solvents. Other applications for Ansol M include the manufacture of celluloid products and softeners, cleaning compounds, plastic cements, nitrocellulose cements, linoleum, coated paper, and textile finishes. It is offered by U.S.I. in containers of sizes to meet any manufacturing requirements—from 1-gallon cans and 5 and 54-gallon drums to tank cars of 6,000 and 8,000 gallons.

U.S.I. will gladly give further information on the uses and properties of Ansol M.

## New Odor, Oil Vapor Adsorber

NEW YORK, N. Y.—A new pipeline odor and oil vapor adsorber for use on compressed air lines has been announced here.




Comprising an odor "filter" of special activated coconut shell carbon mounted in a cast iron housing, as shown in the accompanying sketch, the unit is said to remove all odors, odorous gases, and oil vapors which cannot be successfully removed by separators, aftercoolers or air washers.

## TECHNICAL DEVELOPMENTS

*Further information on these items may be obtained by writing to U.S.I.*

**Bleeding of stains** is said to be prevented by a new flat white interior paint, which can be applied by brush or spray. It will hide stains caused by lubricating oils, creosote, tar, asphalt, pitch, and aniline dyes, it is claimed. The maker states that it may be used as a finishing coat or as a primer for other paints. **(No. 260)**

U S I

**A new sealing compound** is waterproof, weatherproof, and permanently plastic, according to the maker, who reports that it can be used for setting tiles, sealing joints and seams, stopping roof leaks, or as an expansion joint in wood block pavements or floors. **(No. 261)**

U S I

**A galvanizing powder** is said to produce a protective surface equal in corrosion resistance to that produced by the hot dip process. Not intended as a substitute for original galvanizing, it is made specifically for repair work and for restoring the surface of metal that has been welded or formed. It is said that no preliminary cleaning or acid pickling is necessary, except where gas welding has formed a highly oxidized surface. **(No. 262)**

U S I

**Corrosion protection** for magnesium alloys is said to be provided by a new treatment which safeguards against attack by atmosphere or salt water, and offers a good base for paints. It is also said that the treatment does not affect finished dimensions. **(No. 263)**

U S I

**A floor surfacing material** is reported to give a smooth but tough rubbery surface that will carry heavy loads. It is resistant to skidding, sound-deadening, and sparkproof, according to the manufacturer. **(No. 264)**

U S I

**A moisture detector** provides a simple, accurate method of measuring the amount of moisture in wood beneath a paint film, according to a recent announcement. Electrode needles penetrate the surface of the paint film without marring the finish, the announcement states. **(No. 265)**

U S I

**A granular compound** is employed with water and a new solvent to remove buffing and polishing compounds from brass parts, according to a recent report. It is said that the compound removes grease and dirt from the surface. **(No. 266)**

U S I

**A zinc chromate primer** can be used for all kinds of metal work, interior and exterior, according to a recent announcement. It is said that the primer is especially suitable for use as an undercoat for oil-base or synthetic paints and enamels, and that it can be applied by brushing, dipping, or spraying. **(No. 267)**

U S I

**Electroplating with a brush** is reported to be possible with an inexpensive kit recently placed on the market. The manufacturer's announcement says that the method is particularly applicable to small jobs or for touching up small areas. **(No. 268)**


# U.S.I. INDUSTRIAL CHEMICALS, INC.

60 EAST 42ND ST., N. Y. (U.S.I.) BRANCHES IN ALL PRINCIPAL CITIES

A SUBSIDIARY OF U. S. INDUSTRIAL ALCOHOL CO.

**ALCOHOLS**
Amyl Alcohol
Butyl Alcohol
Fusel Oil—Refined
Methanol

**Ethyl Alcohol**
Anhydrous
Absolute
C. P. 96%
Pure (190 proof)
Specially Denatured
Completely Denatured
U. S. I. (Denatured Alcohol Anti-freeze)
*Super Pyro Anti-freeze
*Solox Proprietary Solvent

***ANSOLS**
Ansol M
Ansol PR

**ESTERS, ACETATES**
Acetic Ether
Amyl Acetate
Butyl Acetate
Ethyl Acetate

**ESTERS, ETHYL**
*Diatol
Diethyl Carbonate
Diethyl Oxalate
Ethyl Chlorocarbonate
Ethyl Formate
Ethyl Lactate

*Registered Trade Mark

**ESTERS, PHTHALATES**
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

**OTHER ESTERS**
Amyl Propionate
Butyl Propionate
Dibutyl Oxalate

**INTERMEDIATES**
Acetoacetanilid
Acetoacet-o-chloranilid
Acetoacet-o-toluidid
Ethyl Acetoacetate
Sodium Ethyl Oxalacetate

**ETHERS**
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

**OTHER PRODUCTS**
Acetone, C.P.
Butyl-mesityl-oxide-oxalate
Cellulose Acetate
Collodions
*Curbay Binders
*Curbay X (Dried Curbay)
*Derex
Ethylene
Methyl Acetone
Nitrocellulose Solutions
Potash, Agricultural
*Vacatone

*Solvents*

## Acetone Now Quoted at 5¢ in Tanks

### Heavy Demand for All Solvents—C. D. Alcohol Advanced 2c—Methyl Acetone Quoted Higher—Petroleum Solvents Boosted in Group 3 Territory—Higher Eastern Prices Likely

THE market for solvents in common with all chemical groups passed through a great period of excitement in the last 30 days. While existing contracts on most solvents have been extended into the final quarter, new contracts and spot sales have, in many instances, been based on higher price levels. Quotations on acetone (both spot and new contracts) have been advanced with tanks at 5c, drums in carlots at 6c and l.c.l. quantities at 6½c. New uses for acetone have helped in developing a rather acute shortage of the product. In addition, an extensive export demand has been in evidence for several weeks. There is very little spot material actually available at the moment.

All of the amyl solvents and plasticizers were firmer in price although no actual price changes were announced. Supplies of amyl acetate are none too plentiful. Producers of butyl alcohol and butyl acetate report that current stocks are at the lowest point in several years. An excellent call for both ethyl and methyl acetates was in evidence.

**Methyl Acetone Up 7c**

The generally firm price structure of natural methyl acetone was also in evidence when the sudden spurt in purchasing brought about a sharp rise of 7c a gallon, establishing tanks at 35c; drums, carlots at 41c; and l.c.l. quantities at 44c.

Quotations on completely denatured alcohol were revised upwards in the middle of the past month. The increase amounted to 2c per gallon and only the C.D. grade was affected, no change being made for the final quarter on any of the special formulas. On the new basis C.D. is quoted at 23½c in tanks; 29½c in drums in carlots. The l.c.l. figure is 34½c and represents a 3c increase over the previous price. All quotations are based at Eastern production points. Movement of anti-freeze alcohol into dealers' hands has so far been fairly satisfactory to producers. Shipments of industrial alcohols for manufacturing purposes was specially heavy in the last 30 days.

**Petroleum Group Higher**

Late in the past month producers of petroleum solvents and diluents in Group 3 placed a general price advance into effect. The increase amounted to ½c. On the new basis cleaners' naphtha in tanks is quoted at 6⅞c-7c; lacquer diluent, 7⅞c-8c; rubber solvent, 6⅞c-7c; Stoddard Solvent, 6⅜c-6½c; v.m.p. naphtha, 6⅞c-7c. Tankwagon quotations in this area were also boosted in proportion. At the month-end producers at Eastern seaboard points had not as yet followed suit, but higher prices were generally looked for by the trade. Light gaseous solvents were much firmer too, and higher prices for these were listed as a strong possibility. Two separate increases were made last month in all grades of petrolatum. With quotations on Russian mineral oil strictly nominal, higher prices were looked for in the domestic grades of white mineral oils.

**Important Price Changes**

ADVANCED

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Acetone (new contracts) tks. | $0.05 | $0.04¼ |
| drs., carlots | .06 | .05¾ |
| l. c. l. | .06½ | .06¼ |
| Alcohol, C. D. tks. | .23½ | .21½ |
| drs., carlots | .29½ | .27½ |
| l. c. l. | .34½ | .32½ |
| Methyl acetone, nat., tks. | .35 | .28 |
| drs., carlots | .41 | .33 |

DECLINED

None

### To Dissolve Institute

The Industrial Alcohol Institute, Inc., will be dissolved not later than January 15, 1940, according to a resolution unanimously adopted at a meeting of its board of directors September 21. The Institute was organized February 20, 1926, and has cooperated since that date with scientific societies, trade organizations and others concerned in protecting and promoting the uses of industrial alcohol—ethyl and denatured—under Federal and State laws.

### Industrial Alcohol Gains

August ethyl alcohol production totaled 18,538,531 proof gals., as compared with 17,421,405 gals. in Aug., '38, and with July's 17,642,710 gals. C. D. output during August amounted to 580,681 wine gals., considerably less than half of the 1,502,076 gals. produced in the like '38 month, although marking a slight advance over the July total of 542,979 gals. Stocks of C. D. again increased, from 670,229 gals. in July to 767,661 at the end of August. This supply was somewhat less than in Aug., '38, when it amounted to 815,966 gals. Activity in S. D. was marked during August, for S. D. output jumped nearly 25% above the previous month's yield, from 6,893,739 to 8,608,994 gals. The August volume was more than 25% larger than in the same month a year ago, when only 6,343,617 gals. were produced. Although both production and shipments of S. D. formulae increased by 25% or so during August, end-of-month stocks proved less than in July, decreasing from 1,344,271 gals. to 1,239,265 gals. The latter volume is slightly more than twice that reported at the end of Aug., '38, 606,899 gals.

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## *Personals*

### ¶ "Bob" Wilson To Receive Chemical Industry Medal—Harrington Directs Retail "Clinic"—

Dr. Robert E. Wilson, president, Pan American Petroleum & Transport, N. Y. City, will be presented with the Chemical Industry Medal of the Society of Chemical Industry on Nov. 10, at the Chemists' Club (N. Y. City). The occasion will be a joint meeting of the American Section, S. C. I., and the A. C. S. Last month, Dr. Wilson was elected to head the A. C. S. in 1941, at the annual meeting in Boston.

Edward C. Harrington, Du Pont, will direct a clinic on retail promotion in the advertising and selling course sponsored by the N. Y. Advertising Club, to be held during February at the Engineering Societies Bldg., N. Y. City.

Charles A. Buerk, Buffalo Electro-Chemical Co., Buffalo, N. Y., has been named chairman of the membership committee of the Chamber of Commerce in that city.

E. L. Luaces, N. Y. consultant, spoke on Oct. 11 at the Bellevue-Stratford Hotel, Philadelphia, before the Safe Practice Conference of the Pennsylvania Department of Labor and Industry on the subject of "Profitable Recovery of Carbon Bisulfide and Hydrogen Sulfide In Viscose Rayon Plants."

### Move U.C.C. Units

Effective Tuesday, Oct. 5, the general publicity offices of the Union Carbide and Carbon Co., and of the several units affiliated with it (Linde Air Prods., Electro Metallurgical, Haynes Stellite, Carbide and Carbon Chemicals, and Oxweld), were transferred from 205 E. 42 st., N. Y. City, to the Carbide and Carbon Building, 30 E. 42 st. All departments of the UCC organization are now located in the headquarters building at Number 30.

### Wins Salesmen's Golf

Charles Alexander, Seldner & Enequist, N. Y. City, captured his second leg on the golf cup of the Salesmen's Association of the American Chemical Industry at the final tournament of the season, held Sept. 19 at the Pomonok Country Club, Pomonok, N. Y. Ninety members and guests participated in the tournament, while over 100 attended the dinner in the evening.

# CITRIC ACID

•

## *Announcement*

**Chas. Pfizer & Co., as the largest producers of Citric Acid and Citrates in the world, wish to now assure the consumers in the United States that this company will make no advance in their present prices for these products for at least one year from October 1st, 1939.**

•

CHAS. **PFIZER** & CO., INC.

**Manufacturing Chemists**

81 MAIDEN LANE, NEW YORK 444 W. GRAND AVENUE, CHICAGO, ILL.

*Fine Chemicals*

# Spectacular Rise in Mercury Prices

**News of Shipments of Spanish Metal Causes Market Reaction—All Mercurials Advanced—Speculative Buying in Camphor and Menthol—All the Tartars Quoted Higher—**

THE first month of a new European War was a period of great excitement in the markets for fine chemicals, pharmaceuticals, medicinals and aromatic chemicals. Yet, to the "oldtimers," the situation was quite different than it was just 25 years ago. Then it was recognized that this country was dependent upon outside sources of supply for a long list of essential items. Today the dependence of this country is decidedly less, especially upon imports from Germany.

**Mercury Up—Then Declines**

Price changes in the first 30 days were largely in the tartar products, mercury derivatives, strychnine, minor alkaloids, and salts of various metals. The rise in mercury was particularly spectacular. With rapid successive advances, quotations on the metal finally reached the $160-$170 per flask range. Near the month-end a price reaction set in when it became apparent that Spanish mercury would become available in larger quantities than was first expected by the trade. The important mercury compounds were still at record prices at the close of the month, including calomel, corrosive sublimate, and the soft mercurials.

With considerable speculative buying in evidence the quotations for natural camphor and menthol moved into much higher levels. Santonin was another item to register an early price advance. Higher prices were reported for all glycerophosphates. A 1½c increase in U.S.P. zinc stearate was announced in the middle of the month. Suppliers of quinine products adopted during the month an unique method of billing to indicate to consumers the high cost of freight rates, insurance, etc.

**Glycerine Firm But Unchanged**

Prices on C.D. alcohol were "upped" 2c and producers reported that they would only take business on this basis up to and including December 31. Prices on all other grades were reported unchanged for the final quarter. Rather strange has been the action of glycerine. The item failed to make any price gains in the first 30 days of the new European War due largely, it is reported, because of the presence of fairly large stocks. However, a firm price tone was in evidence at the month-end. Producers are endeavoring to restrict exports in order to provide for all legitimate domestic requirements.

Castor oil was advanced by all producers. All grades of castile soap were priced higher. Rising cost of raw material forced higher quotations on adeps lanae.

**Important Price Changes**

ADVANCED

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Acid tartaric | $0.31¼ | $0.27¼ |
| Adeps lanae, hydrous | .25 | .16 |
| anhydrous | .26 | .17½ |
| Cadmium bromide | 1.56 | 1.51 |
| iodide | 3.92 | 3.87 |
| metal | .65 | .55 |
| Calomel | 2.57 | 1.52 |
| Camphor, nat., slabs | .70 | .48 |
| powder | .70 | .47½ |
| Corrosive sublimate, cryst. | 2.14 | 1.32 |
| granular | 1.99 | 1.17 |
| Cream of tartar | .25¼ | .22¼ |
| Menthol, nat. | 3.35 | 2.85 |
| Mercury, metal | 150.00 | 93.00 |
| Mercury oxide, red, N. F. | 2.66 | 1.81 |
| yellow, U. S. P. | 2.78 | 2.03 |
| Rochelle salt | .20¾ | .18¾ |
| Santonin | 120.00 | 110.00 |
| Seidlitz mixture | .16⅛ | .14⅝ |
| Sulfanilamide | 1.65 | 1.00 |
| Tartar emetic | .29¾ | .27¾ |
| White precipitate | 2.59 | 1.89 |
| Zinc stearate, U. S. P. | .22½ | .21 |

DECLINED

None

In a welter of announcements of higher prices buyers derived some comfort from the statement made by one of the largest factors in the citric acid field that they would make no change in quotations for one year beginning October 1, '39.

The final week of the past month saw the return of some degree of sanity and a sharp decline in purely speculative buying. While the general price trend is expected to go higher, both buyers and suppliers are hoping for more orderly markets now that the first shock of a new European War has come and gone. Suppliers have aided greatly by clearly indicating that they will meet wherever possible all manufacturing requirements of their customers for raw materials but will not permit some buyers to accumulate stocks to the final detriment of others. They rightfully view the present condition as an extraordinary emergency requiring special and firm handling.

## New Merck Building Plan

Plans for 3 new buildings and additions to 2 existing structures at the Merck & Co. plant, Rahway, N. J., were announced Sept. 23. by George W. Merck, president. New construction program, entailing the expenditure of more than $300,000, was to be started immediately and is in addition to the erection of a $100,000 laboratory building started earlier. All of the new buildings will be of brick construction with sprinkler systems throughout.

A 2-story addition to one of the buildings will provide about 4,000 sq. ft. of space for research purposes. A new pilot plant building, comprising 6,000 sq. ft,. will provide facilities for experimental work in transferring processes from the laboratory stage to full-scale production. It will match the present plant in appearance and will more than double facilities of that type.

A manufacturing building containing 17,000 sq. ft. of floor space will house operations now in the development stage, and an addition also will be made to one of the present manufacturing buildings. A new unit will be constructed for storage purposes, containing 11,000 sq. ft. and adjoining the present warehouses.

It is expected the new buildings and additions will be completed before Spring. It was stated that no great increase in the plant working force, now about 1,500, would be made in the near future

## M.M.&R. Market Letter

Magnus, Mabee & Reynard, N. Y. City, have distributed over 10,000 copies of their market letter, an exact copy of that issued by them on August 6, 1914, when was announced the withdrawal of all previous quotations and prices on the firm's stocks of essential oils and kindred goods.

## Not Merck & Co., Inc.

In a recent dispatch from London, published in a number of American newspapers, it was stated that several hundred foreign concerns had been placed on a "blacklist" by the British government. One of the concerns mentioned in the dispatch was "the Merck chemical company." Subsequent publication of the official list in full disclosed that the chemical company referred to was "Casa Chimica Merck" of Brazil, and "Merck Quimica Argentina" of the Argentine, South America.

To avoid any possible confusion, it is pointed out that the British government list did not refer to the firm of Merck & Co., Inc., manufacturing chemists, of Rahway, N. J., or Merck & Co., Ltd., of Montreal, Canada, regardless of the similiarity of names.

## Alpha Chi Sigma Meets

William Stoddard, Jr., was the principal speaker at the Oct. 4 meeting of the Alpha Chi Sigma Fraternity, N. Y. Professional Group, held at the McGraw-Hill Auditorium. Mr. Stoddard, who has just completed 3 years in Russia working on electroplating problems, gave a vivid description of conditions in the Soviet.

E. L. Luaces, well known consultant and technologist in the field of activated carbon, will be the principal speaker at the Nov. 1 meeting of the group to be held as usual in the McGraw-Hill Bldg.

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Col. Byron C. Goss, president, Lake Erie Chem. Co., Cleveland, is now in southern Europe on a business trip.

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**Especially:**

**Talha (Ghezerah)**
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**Madagascar**
**Sandarac**
**Red (Powdered)**
**Tragacanth**
**Karaya (Indian)**

**CHLORATE OF POTASH (Powdered)**

**AMORPHOUS PHOSPHORUS (Red)**

**YELLOW PHOSPHORUS**

**BLACK NEEDLE ANTIMONY SULPHIDE**

**SESQUISULPHIDE OF PHOSPHORUS**

**AMMONIUM PHOSPHATE (Crystal and Powdered)**

**PARAFFIN WAX (Yellow and White Crude Scale)**

**BARIUM CHLORATE** **PERCHLORATE OF POTASH**

**GLYCERINE (High Test)** **GLUES**

**OFFERINGS:**

**Should be submitted with complete information as to analysis, quantities, brand, packing, delivery. On materials now in U. S. quote prices f.o.b. point of origin. On foreign materials, afloat or to be shipped from abroad, quote ex-dock Atlantic or Pacific ports.**

**QUOTATIONS:**

**Will be submitted, if and when possible, upon receipt of specific inquiries.**

**TERMS:**

**We are prepared to pay spot cash for all purchases and will expect similar payment on all sales to firms without established rating.**

## C. W. CAMPBELL CO. INC.

*Importers and Exporters*

**INDUSTRIAL CHEMICALS** **FOREIGN RAW MATERIALS**
**MATCH MAKING *and* PYROTECHNICAL MATERIALS**

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***Raw Materials***

# Quotations on Most Items on Nominal Basis

**Buyers Rush to Acquire Spot Stocks—Sellers Largely Reserve Material for Regular Customers—Shellac Advanced—Heavy Export Demand for Naval Stores—Corn Derivatives Up—**

THE markets for natural raw materials in the past month were just about as close as it is possible to be to complete confusion. Buyers immediately upon the outbreak of the war abroad sought to acquire stocks of practically every material with the natural result that prices first rose to much higher levels and then when buyers still persisted suppliers resorted to reporting that quotations were strictly on a nominal basis. Under such circumstances it is very difficult to give a true picture of actual values based on real sales transactions. A long list of important raw materials could be compiled that were unobtainable at any figure. On imported items first hands were in deep quandary as to what replacement costs actually will be. To add to the state of confusion freight rates and raw risk insurance rates fluctuated almost from day to day. Shipping space from many ports cannot be arranged for, certainly not with any degree of certainty as to when actual shipment can be made.

Near the close of the month there was a slight breathing spell and buyers became slightly calmer, realizing no doubt, that hysteria was only forcing prices up and that such action was only adding greater fuel to the fire. First-hands, in most instances, did what they could to take care of their regular customers' immediate needs.

**Important Price Changes**

**ADVANCED**

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Albumen, blood, light | $0.55 | $0.52 |
| egg, dom. | .64 | .58 |
| Chestnut bark, extract, tks. | .01¾ | .01⅝ |
| Corn sugar, tanners | 3.14 | 3.04 |
| Corn syrup 42° | 3.17 | 3.07 |
| 43° | 3.22 | 3.12 |
| Dextrin, British gum | 3.80 | 3.70 |
| corn canary | 3.75 | 3.45 |
| white | 3.50 | 3.40 |
| Egg Yolk | .62 | .59 |
| Gambier, extract | .09 | .06½ |
| Hemlock extract, tks. | .02¾ | .02⅝ |
| Myrobalans J1 | 30.00 | 24.00 |
| J2 | 21.00 | 19.00 |
| extract, powdered | .06 | .05 |
| Sago flour | .04 | .02½ |
| Shellac, bone-dry | .24 | .18 |
| Garnet | .16 | .12½ |
| Superfine | .17 | .10 |
| T. N. | .16 | .09½ |
| Starch, pearl | 2.65 | 2.55 |
| powdered | 2.75 | 2.65 |
| potato | .06 | .04 |
| Tapica, Flour | .04½ | .02½ |
| Tumeric, Alleppey | .09½ | .06¼ |
| Madras | .11 | .06¾ |
| Wattle bark extract | .05½ | .04 |

**DECLINED**

None

**Shellac Up Sharply**

The general advance in raw materials naturally had severe repercussions in the local markets for shellac. Buyers suddenly became highly insistent on covering their requirements for the next few months and existing stocks were totally inadequate. The nominal position of the shellac market was easily matched by the situation in natural varnish gums. The entire list, with but very few exceptions, advanced strongly and at the month-end quotations were largely nominal.

The situation in Carnauba was almost without parallel in the history of the wax markets. Many important factors were without spot goods and material was practically unobtainable. What small lots were available were eagerly snatched up by buyers paying high premiums. Quotations were strictly nominal at the month-end. The extreme difficulty in getting Carnauba forced buyers into Candelilla in many instances. Spot stocks of Japan were small in comparison to the demand and dealers with supplies were able to get worthwhile premiums. There was a definite shortage of Bayberry. Montan stocks are said to be completely exhausted.

**Gains in Naval Stores**

In common with other markets price gains were registered in turpentine and rosin. A large wave of export buying broke with the news of the outbreak of war in Europe. From primary centers it is reported that still further heavy purchasing from abroad is expected.

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## *Obituaries*

Edward C. Merritt, 78, retired vice-president of the Solvay Sales Corp., N. Y. City, died last month at his Garden City, N. Y., home, after a four month's illness. He retired in 1924, after 49 years' service with the Solvay companies. He went to work in 1875, for Wing & Evans, Inc., which later was merged with the Solvay Sales Corp.

Surviving are his wife, the former Grace Hollingsworth; a daughter, Mrs. Harold D. Pennington, of Garden City, and a son, Harold F. Merritt, who is now a vice-president of Solvay Sales.

### Andrew A. Holmes

Andrew Allgood Holmes, 59, died Friday, Sept. 22, in N. Y. City. Vice-president in charge of sales for U. S. Potash Co., N. Y. City, he was one of best known men in the American fertilizer industry.

Born in Rome, Georgia, he was graduated from the Univ. of North Carolina, in 1901, and received his M.E. at Cornell in 1904. From then until 1922, he was connected with a number of manufacturing and engineering enterprises in the South. In 1922, he went with American Potash & Chemical as sales manager, which position he held until 1927. From 1928 to 1932, Mr. Holmes was special

European representative of G. Ober & Sons, Baltimore, and in the latter year joined U. S. Potash, becoming vice-president in charge of sales in 1933.

He is survived by his widow, Leah Britton Holmes, and by two sons, Britton Holmes and J. B. S. Holmes.

He was a member of Kappa Sigma fraternity, Wykagyl Country Club, New Rochelle, N. Y., and the Chemists' Club, N. Y. City.

### Edwin H. Watson

Edwin H. Watson, 56, died Sept. 24 at his home in Plandome Manor, N. Y., after a long illness. He was managing director of the group of American companies including American-British Chemical Supplies, Kay-Fries Chemicals, and Charles Tennant & Co., Ltd., of Canada, with headquarters in N. Y. City.

He is survived by his wife, Mrs. Guinevere Armstrong Watson, and a son, Harry D. Watson.

### James B. D. Edge

James B. D. Edge, 65, a vice-president and director of Du Pont, died Oct. 4 in his home near Kennett Square, Pa. He had been with the company since the age of 18. During the World War, he was sent to South America to supervise nitrate mining and shipping operations.

**Other Deaths of the Month**

Canfield Jordan, 57, president of W. H. & F. Jordan, Jr., manufacturing chemists, Philadelphia, on Sept. 12. He was president of the company, one of the oldest in Philadelphia, for over a quarter century.

Mrs. E. C. Thompson, wife of the assistant general manager of the Grasselli Chemicals Dept., Du Pont, died suddenly on September 6, while visiting in Ishpeming, Mich.

# NUCHAR

## ACTIVATED CARBON

**Offers a simple means of replacing the old purification methods with the assurance of successful operations. Adsorption of impurities by Activated Carbon means their removal; and because of the great progress made in the direction of increasing the adsorptive power per unit of carbon, Activated Carbon has shown marked monetary savings over other purification processes. In addition, in many instances, it has been possible to purify liquids and solutions that did not respond to other methods of treatment.**

**Effectiveness, as well as economy of Activated Carbon as a purifying medium, has now been fully demonstrated over a wide field of Industrial Activity. It represents standard practice in quite a number of operating processes such as:**

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| Chemicals | Food Products | Purification |
| Curing Solutions | Fruit Juices | Recovery |
| Distillation | Gelatine | Trade Wastes |
| Drugs & Pharmaceuticals | Glycerine | Vegetable Oils |
| Dry Cleaning | Industrial Water | Waste Dye Liquor |
| Essential Oils | Off-Grade Products | Water |

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*Agricultural Chemicals*

## Natural Ammoniates Scarce and Higher

**Little Imported Material on Spot Available—Mixers Not Buying Heavily—No Scarcity of Potash—Tag Sales in Midwest Heavy—Outlook Brighter for Next Fertilizer Year—**

REPERCUSSIONS of the outbreak of the new European War continued to feature the markets for raw fertilizer materials. The chief immediate result was higher prices for the natural ammoniates, both domestic and South American imported materials. Buying was not particularly heavy, however, and at the month-end there seemed to be some disposition on the part of suppliers to make some slight price concessions. The active mixing season is still several weeks off and mixers, in most instances, are covered on a large part of their requirements.

Sulfate producers are taking care of contract customers, but apparently had no spot material to offer for October delivery. Potash importers are not accepting any new business. Domestic producers of potash report sufficient stocks available to take care of all normal requirements.

**Important Price Changes**

ADVANCED

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Blood, dried, N. Y. | $4.25 | $2.75 |
| imported | 3.90 | 2.70 |
| Bone meal, dom. | 32.00 | 26.00 |
| Bone, raw, dom., Chgo. | 34.00 | 27.00 |
| Fish scrap, menhaden, dried | 4.25 | 3.15 |
| wet, acid | 3.00 | 2.35 |
| Hoofmeal | 3.25 | 2.50 |
| Nitrogenous mat, Midwest | 2.25 | 1.90 |
| East | 3.00 | 2.30 |
| imported | nominal | 2.25 |
| Tankage, ground | 3.25 | 2.75 |
| Chicago | 4.50 | 2.50 |
| imported | 3.80 | 3.10 |

DECLINED

None

**Gain in August Tag Sales**

Tag sales in August were 20% larger than a year ago. Total sales in the 17 reporting states, according to the N. F. A., amounted to 154,865 tons against 128,701 tons last year.

The increase over a year ago was due to increased sales in the Midwest, with all of the 5 states in the region reporting increases. The gain for the Midwest as a whole was 33%. This increase probably reflects in part larger fall wheat acreage. The A. A. A. has raised the wheat acreage allotments this fall for all of these states. In Missouri, for instance, where August tag sales were practically twice as large as last year, the 1940 acreage allotment is 258,000 acres larger than last year. It is also possible, of course, that farmers who are not cooperating in the agricultural adjustment program are increasing their acreage by a substantial margin.

The annual peak in tag sales in the Midwest occurs in August and September. Approximately 40% of the year's sales is made in these 2 months. Wheat is by far the most important fertilizer-using crop in this region.

Sales in the Midwest in the first 8 months of the year showed a 10% increase over '38, but they were a little below the corresponding period of '37. Each of the 5 states reported a moderate gain over last year, and sales in Kentucky and Kansas were also larger than two years ago.

**2nd Quarter Potash Deliveries**

Deliveries of agricultural potash by member companies of the American Potash Institute, during the second quarter of '39, amounted to 32,835 tons of actual $K_2O$, equivalent to 62,965 tons of potash salts. Constituting this total were 46,170 tons of muriate, 1,089 tons of manure salts, 6,865 tons of sulfate, 5,960 of kainit, and 2,881 of sulfate of potash-magnesia. In addition, deliveries for chemical uses amounted to 9,902 tons of salts equivalent to 6,027 tons of $K_2O$. These figures include salts of domestic and foreign origin, exclusive of importations of potassium nitrate.

In terms of regional consignments, the total of 28,360 tons $K_2O$ delivered within the continental United States was shipped as follows: Northeastern and Mid-Atlantic States 5,188 tons; Southern States (including Virginia) 15,209 tons; Midwestern States 7,416 tons; and West Coast States 547 tons. The balance of 4,475 tons $K_2O$ was delivered to Canada, Cuba, Puerto Rico and Hawaii.

For the first half of '39, deliveries of agricultural $K_2O$ amounted to 38,417 tons, equivalent to 74,987 tons of potash salts, consisting of 53,748 tons muriate; 1,538 tons manure salts, 8,069 tons sulfate; 8,689 kainit; and 2,943 tons of sulfate of potash-magnesia.

### Ryland Now a V.P.

Edward Ryland was elected vice-president in charge of production for Virginia-Carolina Chem. Corp., Richmond, Va., at the annual meeting of stockholders and directors in Richmond, on Sept. 26.

*Oils and Fats*

## Prices of All Oils Soar on War News

**Chinawood Stocks at Low Point—Other Drying Oils Advanced—Offerings Light—Castor Oil Quotations Revised—Prices on Sulfonated Oils Withdrawn—Fish Oils Go Higher**

IT is rather difficult to picture just how sharp the advances were in the important fats and oils in the past 30 days until one makes a comparison of end-of-the-month quotations. With the outbreak of hostilities abroad buyers endeavored to buy huge quantities and what was a buyers' market became overnight strictly a sellers' market. Buyers did not hesitate to bid against each other in a mad scramble to acquire inventories. With many items available only in very limited supply it is no wonder that prices reached fantastic levels when compared with the '39 low point.

Stocks of Chinawood, either in this country or likely to arrive here in the next few months, are totally inadequate for the normal requirements of the coatings industry and other important consuming fields. The situation is fast becoming extremely acute. What oil is arriving appears to have been sold and there is little or no offerings available. Resellers on the Pacific Coast were said to be offering limited quantities at 27c in tanks.

All of the principal drying oils moved into higher ground. In this group commanding much higher prices were linseed, babassu, and perilla. Crude menhaden and crude sardine jumped into much higher price levels, necessitating sharp revisions in the various grades of refined.

Even the strictly domestic oils, such as corn, peanut, and soybean commanded higher prices. Suppliers were unwilling, despite quite sizable stocks, to sell on anything but a limited basis.

**Important Price Changes**

ADVANCED

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Oil babassu, tks. | $0.07⅝ | $0.05⅞ |
| Oil castor, No. 3, tks. | .08½ | .07½ |
| Oil Chinawood, tks. | .27 | .21 |
| Oil coconut, crude, Manila, tks. | .04⅝ | .02⅞ |
| Oil corn, crude, tks. | .07⅛ | .05⅛ |
| Oil lard, common | .10 | .07½ |
| Oil linseed, raw, tks. | .102 | .078 |
| Oil Menhaden, crude, tks. | .35 | .21 |
| ref'd alkali, tks. | .076 | .056 |
| Oil Neatsfoot 20° C. T. | .19¾ | .14¾ |
| Oil Oleo, No. 1 | .12 | .07¼ |
| Oil Oiticica | .21 | .17 |
| Oil palm, Niger | nominal | .03⅝ |
| Oil peanut, crude, tks. | .07¼ | .05 |
| Oil perilla, tks. | .13½ | .12 |
| Oil Sardine, crude, tks. | .38 | .24 |
| ref'd alkali, tks. | .076 | .056 |
| Oil soybean, crude, tks. | .06½ | .04½ |
| Oil whale, ref'd nat. | .091 | .071 |

DECLINED

None

ADVERTISING PAGES REMOVED

*Pigments and Fillers*

# Buyers Rush To Cover On Raw Paint Materials

## Some Speculative Purchasing Noted in Natural Products—Casein in Spectacular Rise to 20c—Mercury Pigments Higher—All Varnish Gum Prices Strictly Nominal—

THE first two weeks of the past month witnessed just about as hectic times as have ever been seen in the markets for raw paint materials. Consumers flooded suppliers with orders, many attempted to build up inventories in a hurry by placing spot orders with a number of dealers hoping to get some quantities here and there. Needless to say, speculative buying crept in in some instances, although first-line factors tried to maintain a resemblance of order and insisted that, although they would take care of their regular customers, they would not undertake to ship above-the-normal quantities. Towards the end of the month more orderly marketing took place, but buying continued brisk as paint and other coatings manufacturers sought to cover requirements for an active fall season.

Prices, of course, advanced along a very broad front. Unfortunately for the coating manufacturers a goodly proportion of the essential materials are imported. In the natural gums, for example, prices simply shot up so rapidly that buyers could hardly cope with the situation. The broadest price advance since the last war took place in the whole group of natural gums and quotations at the moment are largely if not entirely nominal. It is safe to say that all imported items are pricewise on a strictly nominal basis.

**Lead Pigments Advanced**

The rapidly advancing metal markets caused makers of red lead, litharge, and orange mineral to readjust quotations. On September 26 quotations on white lead in oil were advanced ½c, the new dealer range being based on 10¾c. The spectacular advances in mercury caused several distinct price increases in red and yellow mercuric oxides and in red vermilion. All grades of glue went into higher ground. One large producer of stearates and palmitates announced an advance of 1½c near the close of the month and this action was expected to result in price advances by other makers.

For many moons the industry has heard of the likelihood of 20c casein. It became a reality last month when a series of separate price increases were placed in effect. Nor is it expected that the end is yet in sight. Buying continued to take place in good volume and stocks, despite increasing amounts coming from the Argentine, are none too plentiful.

On items where consumers are protected over the final quarter there will probably be excellent calls for shipment with buyers attempting to lay in inventories against the strong possibility that a generally higher price structure will feature the first quarter of '40.

**Important Price Changes**

**ADVANCED**

| | Sept. 30 | Aug. 31 |
|---|---|---|
| Antimony white pigment | $0.12½ | $0.11½ |
| Barytes, Ital, grd. | 31.50 | 29.50 |
| Casein, 20-30 mesh | .20 | .12½ |
| 80-100 mesh | .20½ | .13 |
| Lead, red, 95% | .081 | .076 |
| 97% | .0835 | .0785 |
| 98% | .086 | .081 |
| Litharge | .0685 | .0635 |
| Mercuric oxide, tech. red | 2.41 | 1.56 |
| yellow | 2.26 | 1.51 |
| Orange mineral | .10¾ | .10¼ |
| Red vermilion | 2.88 | 1.62 |

**DECLINED**

None

**Paint Sales Show Gains**

August paint, lacquer, varnish and filler sales were greatly improved, when compared with those for the previous month. Total sales were valued at $34,448,530 (680 establishments), as compared with $30,758,617 in July, and with $30,182,013 in the like '38 month. Trade sales were estimated to be $19,046,555, as compared with $17,215,946 for July, and with $17,224,845 in August of '38.

### S & W Constructs New Plant

Stroock & Wittenberg Corp., N. Y. City, are constructing a large and modern resin plant for the manufacture of alkyds and allied synthetics. The new production will include their present regular line of alkyds and many new and improved types. Equipment and controls will be of the very latest design to promote safety of operation, quality, uniformity and output. At the new location in Newark, which has both rail and water facilities, ample space has been provided for a contemplated further expansion program. Eventually all S&W synthetic resin manufacturing in Newark may be consolidated on the new site. Temporarily, both plants will be utilized to handle, without interruption, the growing demand for other synthetics and processed naturals, as well as the alkyds.

### Knauss With "RCI"

"Doc" Knauss, for the past five and a half years vice-president in charge of sales for Nuodex Products, Elizabeth, N. J., last month joined the Reichhold sales organization. He will devote his efforts to "RCI" sales in the metropolitan N. Y. area.

Replacing Dr. Knauss, Harold M. Johnson has been made Nuodex's new vice-president in charge of sales. Simultaneously with Mr. Johnson's promotion, Arthur Minich was last month elected by the Nuodex board of directors to vice-president in charge of manufacturing. Robert A. Allen, formerly supervisor of the firms paint service laboratory, was made chief chemist.

### Now a Color Division

Reichhold Chemicals, Detroit, has announced that the Fred L. Lavanburg Co. of Brooklyn, N. Y., is now an integral part of the Reichhold organization, and henceforth will be known as Reichhold Chemicals, Inc., Chemical Color Division. The Lavanburg plant has just been completely modernized and renovated.

### Buys Pigment Plant

National Lead has purchased from George S. Mepham Corp., manufacturer of earth pigments and dry colors of E. St. Louis, Ill., the latter's newly-completed plant at Texarkana, Tex. The Texarkana works specializes in the production of iron oxide for use as a weighting material for oil well drilling muds.

### Wins Direct Mail Award

The board of judges of the Direct Mail Advertising Association has selected Merck & Co., Inc., manufacturing chemists, Rahway, N. J., as one of the 50 direct mail leaders of 1939, according to an announcement made by Douglas Wakefield Coutlee, advertising director of the company. The award was made on the basis of outstanding direct mail literature employed in the professional promotion of several Merck medical products. *The Merck Report*, a magazine for physicians and pharmacists, and edited by Mr. Coutlee, was also included in the winning presentation. This is the second time Merck & Co., Inc., has received the direct mail advertising award.

### Laboratory Heads Meet

The American Council of Commercial Laboratories met Sept. 18-19 in N. Y. City to discuss policies and plans in conjunction with technical services to the government, as part of preparedness for any possible national emergency.

### Chemical Catalog Out

The 1939 edition of the *Chemical Engineering Catalog* was issued last month by Reinhold Publishing Corp., 330 W. 42nd st, N. Y. City. Volume contains over 1000 pages displaying, with many illustrations and tables, equipment and accessories for the process industries. The *Catalog* also lists sources of supply for industrial chemicals and raw materials, and is supplemented by classified indexes of such equipment and materials, carefully cross-referenced.

# Prices Current

***Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.***

**Chemical prices** quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

**Purchasing Power of the Dollar: 1926 Average—$1.00 - 1937 Average $1.10 - Jan. 1939 $1.25 - Sept. 1939 $1.26**

| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Acetaldehyde, drs. c-l, wks lb | ... | .10 | .10 | .14 | ... .14 |
| Acetaldol, 95%, 50 gal drs wks lb. | .21 | .25 | .21 | .25 | .21 .25 |
| Acetamide, tech, lcl, kgs lb. | .28 | .50 | .28 | .50 | .32 .60 |
| Acetanilid, tech, 150 lb bbls lb. | ... | .22 | .22 | .29 | .29 .32 |
| Acetic Anhydride, drs, f.o.b. wks, frt all'd ....lb. | .10½ | .11 | .10½ | .11 | .10½ .11 |
| Acetin, tech, drs. .....lb. | ... | .33 | ... | .33 | .. .33 |
| Acetone, tks, f.o.b. wks, frt all'd .....lb | .04¼ | .05 | .04¼ | .05 | ... .04¾ |
| drs, c-l, f.o.b. wks, frt all'd lb | .05¾ | .06 | .05¾ | .06 | ... .05¾ |
| Acetyl chloride, 100 lb cbys lb | .55 | .68 | .55 | .68 | .55 .68 |
| **ACIDS** | | | | | |
| Abietic, kgs, bbls .....lb | .08¾ | .09 | .08¾ | .09 | .08¾ .10 |
| Acetic, 28%, 400 lb bbls, c-l, wks .....100 lbs | ... | 2.23 | ... | 2.23 | ... 2.23 |
| glacial, bbls, c-l, wks 100 lbs. | ... | 7.62 | ... | 7.62 | ... 7.62 |
| glacial, USP bbls, c-l, wks. .....100 lbs. | ... | 10.25 | ... | 10.25 | ... 10.25 |
| Acetylsalicylic, USP, 225 lb bbls .....lb. | ... | .40 | .40 | .50 | .50 .60 |
| Adipic, kgs, bbls .....lb. | ... | .72 | ... | .72 | ... .72 |
| Anthranilic, ref'd, bbls...lb. | 1.15 | 1.20 | 1.15 | 1.20 | 1.15 1.20 |
| tech bbls .....lb. | ... | .75 | ... | .75 | ... .75 |
| Ascorbic, bot .....oz. | 2.75 | 3.00 | 2.75 | 3.25 | ... ... |
| Battery, cbys, wks ...100 lbs. | 1.60 | 2.55 | 1.60 | 2.55 | 1.60 2.55 |
| Benzoic tech, 100 lb kgs lb. | .43 | .47 | .43 | .47 | .43 .47 |
| USP, 100 lb kgs .....lb. | .54 | .59 | .54 | .59 | .54 .59 |
| Boric, tech, gran, 80 tons, bgs, delv .....ton *a* | ... | 96.00 | ... | 96.00 | 95.00 96.00 |
| Broenner's, bbls .....lb. | ... | 1.11 | ... | 1.11 | ... 1.11 |
| Butyric, edible, c-l, wks, cbys lb. | 1.20 | 1.30 | 1.20 | 1.30 | 1.20 1.30 |
| synthetic, c-l, drs, wks..lb. | ... | .22 | ... | .22 | ... .22 |
| wks, lcl .....lb. | ... | .23 | ... | .23 | ... .23 |
| tks, wks .....lb. | ... | .21 | ... | .21 | ... .21 |
| Camphoric, drs .....lb. | 5.50 | 5.70 | 5.50 | 5.70 | 5.50 5.70 |
| Caproic, normal, drs. ....lb. | ... | .35 | ... | .35 | ... ... |
| Chicago, bbls .....lb. | ... | 2.10 | ... | 2.10 | ... 2.10 |
| Chlorosulfonic, 1500 lb drs, wks .....lb. | .03½ | .05 | .03½ | .05 | .03½ .05 |
| Chromic, 99¾%, drs, delv lb. | .15¼ | .17¼ | .15¼ | .17¼ | .15¼ .17¼ |
| Citric, USP, crys, 230 lb bbls. .....lb. *b* | .20 | .21½ | .20 | .22½ | .22 .25 |
| anhyd, gran, bbls .....lb. *b* | ... | .23 | .23 | .25 | .25½ .26½ |
| Cleve's, 250 lb bbls .....lb. | ... | .57 | ... | .57 | .50 .57 |
| Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal. | .49 | .50 | .49 | .64 | .63 .91 |
| 99%, straw, LB, drs, wks, frt equal .....gal. | .55 | .56 | .55 | .71 | .69 .94 |
| resin grade, drs, wks, frt equal .....lb. | .08¼ | .09¼ | .08¼ | .09½ | .09 .11¼ |
| Crotonic, bbls, delv .....lb. | .21 | .50 | .21 | .50 | .21 1.00 |
| Formic, tech, 140 lb drs..lb. | .10½ | .11½ | .10½ | .11½ | .10½ .11½ |
| Fumaric, bbls .....lb. | ... | .75 | ... | .75 | .60 .75 |
| Fuming, see Sulfuric (Oleum) | | | | | |
| Gallic, tech, bbls .....lb. | .70 | .73 | .70 | .73 | .70 .79 |
| USP, bbls .....lb. | .77 | .81 | .77 | .81 | .77 .91 |
| Gamma, 225 lb bbls, wks..lb. | ... | .85 | ... | .85 | ... .85 |
| H, 225 lb bbls, wks .....lb. | .50 | .55 | .50 | .55 | .50 .55 |
| Hydriodic, USP, 47%...lb. | ... | 2.30 | ... | 2.30 | 2.20 2.30 |
| Hydrobromic, 34% conct 155 lb cbys, wks .....lb. | .42 | .44 | .42 | .44 | .42 .44 |
| Hydrochloric, see muriatic | | | | | |
| Hydrocyanic, cyl, wks ...lb. | .80 | 1.30 | .80 | 1.30 | .80 1.30 |
| Hydrofluoric, 30%, 400 lb bbls, wks .....lb. | .06 | .06½ | .06 | .07½ | .07 .07½ |
| Hydrofluosilicic, 35%, 400 bbls, wks .....lb. | .09 | .09½ | .09 | .09½ | .09 .15 |
| Lactic, 22%, dark, 500 lb bbls lb. | .02½ | .02¾ | .02½ | .02¾ | .02½ .02¾ |
| 22%, light ref'd, bbls..lb. | .03½ | .03¾ | .03½ | .03¾ | .03½ .03¾ |
| 44%, light, 500 lb bbls .lb. | .05½ | .05¾ | .05½ | .05¾ | .05½ .05¾ |
| 44%, dark, 500 lb bbls .lb. | .06½ | .06¾ | .06½ | .06¾ | .06½ .06¾ |
| 50%, water white, 500 lb bbls .....lb. | .10½ | .11½ | .10½ | .11½ | .10½ .11½ |
| USP X, 85%, cbys ....lb. | .42 | .45 | .42 | .45 | .42 .45 |
| Lauric, drs. .....lb. | 11¼ | .12¼ | .11¼ | .12¼ | .08½ .12¼ |
| Laurent's, 250 lb bbls ...lb. | .45 | .46 | .45 | .46 | .45 .46 |
| Levulinic, 5 lb bot wks ...lb. | ... | 2.00 | ... | 2.00 | ... 2.00 |
| Linoleic, bbls .....lb. | ... | .20 | ... | .20 | ... .20 |
| Maleic, powd, kgs .....lb. | .30 | .40 | .30 | .40 | .30 .40 |
| Malic, powd, kgs .....lb. | .45 | .60 | .45 | .60 | .45 .60 |
| Metanillic, 250 lb bbls ...lb. | .60 | .65 | .60 | .65 | .60 .65 |
| Mixed, tks, wks .....N unit | .06½ | .07¼ | .06½ | .07¼ | .06½ .07¼ |
| S unit | .008 | .009 | .008 | .009 | .008 .009 |
| Monochloracetic, tech, bbls lb. | .16 | .18 | .16 | .18 | .16 .18 |
| Monosulfonic, bbls ..... lb. | 1.50 | 1.60 | 1.50 | 1.60 | 1.50 1.60 |
| Muriatic, 18°, 120 lb cbys, c-l, wks .....100 lb. | ... | 1.50 | ... | 1.50 | ... 1.50 |
| tks, wks .....100 lb. | ... | 1.00 | ... | 1.00 | ... 1.00 |
| 20°, cbys, c-l, wks..100 lb. | ... | 1.75 | ... | 1.75 | ... 1.75 |
| tks, wks .....100 lb. | ... | 1.10 | ... | 1.10 | ... 1.10 |
| 22°, c-l, cbys, wks..100 lb. | ... | 2.25 | ... | 2.25 | ... 2.25 |
| tks, wks .....100 lb. | ... | 1.60 | ... | 1.60 | ... 1.60 |
| CP, cbys .....lb. | .06½ | .07⅛ | .06½ | .07⅛ | .06½ .07⅛ |
| N & W, 250 lb bbls .....lb. | .85 | .87 | .85 | .87 | .85 .87 |
| Naphthenic, 240-280 s.v., drs lb. | .10 | .13 | .10 | .13 | .10 .13 |
| Sludges, drs .....lb. | ... | .05 | ... | .05 | ... .05 |
| Naphthionic, tech, 250 lb bbls lb. | .60 | .65 | .60 | .65 | .60 .65 |
| Nitric, 36°, 135 lb cbys, c-l, wks .....100 lb. *c* | ... | 5.00 | ... | 5.00 | ... 5.00 |
| 38°, c-l, cbys, wks 100 lb. *c* | ... | 5.50 | ... | 5.50 | ... 5.50 |
| 40°, cbys, c-l, wks 100 lb. *c* | ... | 6.00 | ... | 6.00 | ... 6.00 |
| 42°, c-l, cbys, wks 100 lb, *c* | ... | 6.50 | ... | 6.50 | ... 6.50 |
| CP, cbys, delv .....lb. | .11½ | .12½ | .11½ | .12½ | .11½ .12½ |
| Oxalic, 300 lb bbls, wks, or N Y .....lb. | .10¾ | .12 | .10¾ | .12 | .10¾ .12 |
| Phosphoric, 85%, USP, cbys lb. | .12 | .14 | .12 | .14 | .12 .14 |
| 50%, acid, c-l, drs, wks .lb. | .06 | .08 | .06 | .08 | .06 .08 |
| 75%, acid, c-l, drs, wks .lb. | | .07½ | | .07½ | .07½ .10½ |
| Picramic, 300 lb bbls, wks lb. | .65 | .70 | .65 | .70 | .65 .70 |
| Picric, kgs, wks .....lb. | .35 | .40 | .35 | .40 | .35 .40 |
| Propionic, 98% wks, drs..lb. | | .22 | ... | .22 | ... .22 |
| 80% .....lb. | .16 | .17½ | .16 | .17½ | .16 .17½ |
| Pyrogallic, tech, lump, pwd, bbls .....lb. | | 1.05 | ... | 1.05 | ... 1.05 |
| cryst, USP .....lb. | 1.45 | 1.63 | 1.45 | 1.63 | 1.45 1.63 |
| Ricinoleic, bbls .....lb. | ... | .35 | ... | .35 | .35 .38 |
| tech, bbls .....lb. | ... | .13 | ... | .13 | ... .13 |
| Salicylic, tech, 125 lb bbls, wks .....lb. | | .33 | ... | .33 | ... .33 |
| USP, bbls .....lb. | .35 | .40 | .35 | .40 | .35 .45 |
| Sebacic, tech, drs, wks ..lb. | ... | nom. | ... | nom. | .37 .41 |
| Succinic, bbls .....lb. | ... | .75 | ... | .75 | ... .75 |
| Sulfanilic, 250 lb bbls, wks lb. | .17 | .18 | .17 | .18 | .17 .18 |
| Sulfuric, 60°, tks, wks ...ton | ... | 13.00 | ... | 13.00 | ... 13.00 |
| c-l, cbys, wks ...100 lb. | ... | 1.25 | ... | 1.25 | ... 1.25 |
| 66°, tks, wks .....ton | ... | 16.50 | ... | 16.50 | ... 16.50 |
| c-l, cbys, wks ....100 lb. | ... | 1.50 | ... | 1.50 | ... 1.50 |
| CP, cbys, wks .....lb. | .06½ | .07½ | .06½ | .07½ | .06½ .07½ |
| Fuming (Oleum) 20% tks, wks .....ton | ... | 18.50 | ... | 18.50 | ... 18.50 |
| Tannic, tech, 300 lb bbls..lb. | .40 | .47 | .40 | .47 | .40 .47 |
| Tartaric, USP, gran, powd, 300 lb bbls .....lb. | .31¼ | .31¾ | .27¼ | .31¾ | .24¼ .27¾ |
| Tobias, 250 lb bbls .....lb. | .55 | .60 | .55 | .67 | .65 .67 |
| Trichloroacetic bottles ...lb. | 2.00 | 2.50 | 2.00 | 2.50 | 2.00 2.50 |
| kgs .....lb. | ... | 1.75 | | 1.75 | 1.75 |
| Tungstic, tech, bbls .....lb. | ... | ... | 1.70 | 1.80 | 1.65 2.00 |
| Vanadic, drs, wks .....lb. | ... | ... | 1.10 | 1.20 | 1.10 1.20 |
| Albumen, light flake, 225 lb. bbls .....lb. | .55 | .68 | .52 | .68 | .52 .60 |
| dark, bbls .....lb. | .13 | .18 | .13 | .18 | .11 .18 |
| egg, edible .....lb. | .64 | .68 | .58 | .78 | .77 1.15 |
| **ALCOHOLS** | | | | | |
| Alcohol, Amyl (from Pentane) tks, delv .....lb. | ... | .101 | ... | .101 | .101 .106 |
| c-l, drs, delv .....lb. | ... | .111 | ... | .111 | .111 .116 |
| lcl, drs, delv.....lb. | ... | .121 | ... | .121 | .121 .126 |
| Amyl, secondary, tks, delv lb. | ... | .08½ | ... | .08½ | ... .08½ |
| drs, c-l, delv E, of Rockies .....lb. | | .09½ | ... | .09½ | ... .09½ |
| Benzyl, cans .....lb. | .68 | 1.00 | .68 | 1.00 | .68 1.00 |
| Butyl, normal, tks, f.o.b. wks, frt all'd .....lb. *d* | ... | .07 | .07 | .08½ | .08½ .09 |
| c-l, drs, f.o.b. wks, frt all'd .....lb. *d* | ... | .08 | .08 | .09½ | .09½ .10 |
| Butyl, secondary, tks, delv .....lb. *d* | ... | .05½ | .05½ | .06 | ... .06 |
| c-l, drs, delv ....lb. *d* | ... | .06½ | .06½ | .07 | ... .07 |
| Capryl, drs, tech, wks ..lb. | | .85 | | .85 | .85 |
| Cinnamic, bottles .....lb. | 2.00 | 2.50 | 2.00 | 2.50 | 2.00 2.50 |
| Denatured, CD, 14, c-l, drs, wks .....gal. *e* | .29½ | .34½ | .27½ | .34½ | .31 .35 |
| tks, East, wks .....gal. | ... | .23½ | .21½ | .24 | .23 .29 |
| Western schedule, c-l, drs, wks .....gal. *e* | ... | .34½ | .34½ | .37 | .36 .38 |
| Denatured, SD, No. 1, tks, | ... | .19½ | .19½ | .22 | .22 .27 |
| c-l, drs, wks .....gal. *e* | ... | .25½ | .25½ | .28 | .28 .33 |

*a* Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls., *y* Price given is per gal.

*c* Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

# *EASTMAN*
# PARA AMINO PHENOL
## Base and Hydrochloride

AVAILABLE in both a purified and a technical grade. . . . Backed by the Eastman reputation for chemicals of highest quality. . . . Continuous production assures prompt shipment from fresh stocks.

**OTHER EASTMAN CHEMICALS**

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Silver Nitrate
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Gallic Acid
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Hydroquinone
Research Organic Chemicals

*Information and quotations will be furnished upon request.*
*Eastman Kodak Co., Chemical Sales Division, Rochester, N. Y.*

**Eastman Tested Chemicals**

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# ABC

## FORMALDEHYDE

U. S. P.

Manufactured by Kay-Fries Chemicals, Inc.

Tank Cars  Drums  Carboys

Inquiries Solicited

AMERICAN-BRITISH CHEMICAL SUPPLIES, Inc.
180 MADISON AVE., NEW YORK, N.Y.

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Alcohols (continued): | | | | | | |
| Diacetone, pure, c-l, drs, delv | lb. *f* | ... | .09 | .09 | .11½ | .11½ |
| tech, contract, drs, c-l, delv | lb. | ... | .08½ | .08½ | .10½ | .10½ |
| Ethyl, 190 proof, molasses, tks | gal. *g* | ... | 4.46 | 4.46 | 4.48½ | 4.04 4.51½ |
| c-l, drs | gal. *g* | ... | 4.49 | 4.49 | 4.54½ | 4.10 4.59½ |
| c-l, bbls | gal. *g* | ... | 4.53 | 4.53 | 4.55½ | 4.11 4.58½ |
| Furfuryl, tech, 500 lb drs | lb. | .25 | .35 | .25 | .35 | .25 .35 |
| Hexyl, secondary tks, delv | lb. | ... | .12 | ... | .12 | ... .12 |
| c-l, drs, delv | lb. | ... | .13 | ... | .13 | ... .13 |
| Normal, drs, wks | lb. | 3.25 | 3.50 | 3.25 | 3.50 | 3.25 3.50 |
| Isoamyl, prim, cans, wks | lb. | ... | .32 | ... | .32 | ... .32 |
| drs, lcl, delv | lb. | ... | .27 | ... | .27 | ... .27 |
| Isobutyl, ref'd, lcl, drs | lb. | ... | .073 | .073 | .09 | .09 .10 |
| c-l, drs | lb. | ... | .068 | .068 | .08½ | .08½ .09½ |
| tks | lb. | ... | .058 | .058 | .07½ | .07½ .08½ |
| Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd | lb. | ... | .36 | ... | .36 | ... .36 |
| Ref'd 98%, drs, f.o.b. wks, frt all'd | gal. | ... | .41 | ... | .41 | ... .41 |
| Tech 91%, drs, above terms | gal. | ... | .33½ | ... | .33½ | ... .33½ |
| tks, same terms | gal. | ... | .28½ | ... | .28½ | ... .28½ |
| Tech 98%, drs, above terms | gal. | ... | .37½ | ... | .37½ | ... .37½ |
| tks, above terms | gal. | ... | .32½ | ... | .32½ | ... .32½ |
| Spec Solvent, tks, wks | gal. | ... | .20½ | .19 | .23 | .23 .28 |
| Aldehyde ammonia, 100 gal drs | lb. | .80 | .82 | .80 | .82 | .80 .82 |
| Aldehyde Bisulfite, bbls, delv | lb. | ... | .17 | ... | .17 | ... .17 |
| Aldol, 95%, 55 and 110 gal, drs, delv | lb. | .11 | .12 | .11 | .20 | ... .20 |
| Alphanaphthol, crude, 300 lb bbls | lb. | ... | .52 | ... | .52 | ... .52 |
| Alphanaphthylamine, 350 lb bbls | lb. | .32 | .34 | .32 | .34 | .32 .34 |
| Alum, ammonia, lump, c-l, bbls, wks | 100 lb. | 3.40 | 3.65 | 3.40 | 3.65 | 3.40 3.65 |
| delv NY, Phila | 100 lb. | ... | 3.40 | ... | 3.40 | ... 3.40 |
| Granular, c-l, bbls wks | 100 lb. | 3.15 | 3.40 | 3.15 | 3.40 | 3.15 3.40 |
| Powd, c-l, bbls, wks | 100 lb. | ... | 3.55 | ... | 3.55 | ... 3.55 |
| Chrome, bbls | 100 lb. | 6.50 | 6.75 | 6.50 | 6.75 | 6.50 6.75 |
| Potash, lump, c-l, bbls, wks | 100 lb. | 3.65 | 3.90 | 3.65 | 3.90 | 3.65 3.90 |
| Granular, c-l, bbls, wks | 100 lb. | 3.40 | 3.65 | 3.40 | 3.65 | 3.40 3.65 |
| Powd, c-l, bbls, wks | 100 lb. | 3.80 | 4.05 | 3.80 | 4.05 | 3.80 4.05 |
| Soda, bbls, wks | 100 lb. | ... | 3.25 | ... | 3.25 | ... 3.25 |
| Aluminum metal, c-l, NY | 100 lb. | ... | 20.00 | ... | 20.00 | ... 20.00 |
| Acetate, 20%, bbls | lb. | .07½ | .09 | .07½ | .09 | .07½ .10 |
| Basic powd, bbls, delv | lb. | .40 | .50 | .40 | .50 | .40 .50 |
| Chloride anhyd, 99%, wks | lb. | .07 | .12 | .07 | .12 | .07 .12 |
| 93%, wks | lb. | .05 | .08 | .05 | .08 | .05 .08 |
| Crystals, c-l, drs, wks | lb. | .06 | .06¼ | .06 | .06¼ | .06 .06¼ |
| Solution, drs, wks | lb. | .02¾ | .03¼ | .02¾ | .03¼ | .02¾ .03¼ |
| Formate, 30% sol bbls, c-l, delv | lb. | ... | .13 | ... | .13 | ... .13 |
| Hydrate, 96%, light, 90 lb bbls, delv | lb. | .12½ | .13½ | .11½ | .13 | .12 .13 |
| heavy, bbls, wks | lb. | .029 | .03½ | .029 | .03½ | .029 .03½ |
| Oleate, drs | lb. | .16¾ | .18½ | .16¾ | .18½ | .16¾ .18½ |
| Palmitate, bbls | lb. | ... | .24½ | .23 | .24½ | ... .23 |
| Resinate, pp., bbls | lb. | ... | .15 | ... | .15 | ... .15 |
| Stearate, 100 lb. bbls | lb. | .17½ | .22½ | .16 | .22½ | .19 .21 |
| Sulfate, com, c-l, bgs, wks | 100 lb. | ... | 1.15 | ... | 1.15 | 1.15 1.35 |
| c-l, bbls, wks | 100 lb. | ... | 1.35 | ... | 1.35 | 1.35 1.55 |
| Sulfate, iron-free, c-l, bgs, wks | 100 lb. | ... | 2.00 | ... | 2.00 | ... 2.00 |
| c-l, bbls, wks | 100 lb. | ... | 2.20 | ... | 2.20 | ... 2.20 |
| Aminoazobenzene, 110 lb kgs | lb. | ... | 1.15 | ... | 1.15 | ... 1.15 |
| Ammonia anhyd fert com, tks | lb. | .04½ | .05½ | .04½ | .05½ | .04½ .05½ |
| Ammonia anhyd, 100 lb cyl | lb. | .16 | .22 | .16 | .22 | .16 .22 |
| 26°, 800 lb drs, delv | lb. | .02¼ | .02½ | .02¼ | .02½ | .02¼ .02½ |
| Aqua 26°, tks, NH. cont. | ... | ... | .04z | ... | .04z | ... .05** |
| tk wagon | lb. | ... | .02 | ... | .02 | ... .02 |
| Ammonium Acetate, kgs | lb. | .26 | .33 | .26 | .33 | .26 .33 |
| Bicarbonate, bbls, f.o.b. wks | 100 lb. | 5.15 | 5.71 | 5.15 | 5.71 | 5.15 5.71 |
| Bifluoride, 300 lb bbls | lb. | .14½ | .16½ | .14½ | .16½ | .14½ .17 |
| carbonate, tech, 500 lb bbls | lb. | .08 | .12 | .08 | .12 | .08 .12 |
| Chloride, White, 100 lb bbls, wks | 100 lb. | 4.45 | 4.90 | 4.45 | 4.90 | 4.45 4.90 |
| Gray, 250 lb bbls, wks | 100 lb. | 5.50 | 6.25 | 5.50 | 6.25 | 5.50 6.25 |
| Lump, 500 lb cks spot | lb. | .10½ | .11 | .10½ | 11. | .10½ .11 |
| Lactate, 500 lb bbls | lb. | .15 | .16 | .15 | .16 | .15 .16 |
| Laurate, bbls | lb. | ... | .23 | ... | .23 | ... .23 |
| Linoleate, 80% anhyd, bbls | lb. | ... | .15 | ... | .15 | ... .15 |
| Naphthenate, bbls | lb. | ... | .17 | ... | .17 | ... .17 |
| Nitrate, tech, cks | lb. | .036 | .0385 | .036 | .0405 | .038 .0405 |
| Oleate, drs | lb. | ... | .15 | ... | .15 | ... .15 |
| Oxalate, neut, cryst, powd, bbls | lb. | .19 | .20 | .19 | .20 | .19 .22½ |
| Perchlorate, kgs | lb. | ... | .16 | ... | .16 | ... .16 |
| Persulfate, 112 lb kgs | lb. | .21 | .24 | .21 | .24 | .21 .24 |
| Phosphate, dibasic tech, powd, 325 lb bbls | lb. | .07½ | .10 | .07½ | .10 | .07½ .10 |
| Ricinoleate, bbls | lb. | ... | .15 | ... | .15 | ... .15 |
| Stearate, anhyd, bbls | lb. | ... | .22 | .22 | .24 | ... .24 |
| Paste, bbls | lb. | ... | .06½ | .06½ | .08 | ... .07½ |

*g* Grain alcohol 25c a gal. higher in each case. **On a delv. basis.
*z* On a f.o.b. wks. basis.

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Ammonium (continued): | | | | | | |
| Sulfate, dom, f.o.b., bulk | ton | ... | 27.25 | 27.00 | 28.00 | 27.00 28.50 |
| Sulfocyanide, pure, kgs | lb. | ... | .55 | ... | .55 | ... .55 |
| Amyl Acetate (from pentane) tks, delv | lb. | ... | .095 | .095 | .10 | .10 .11½ |
| c-l, drs, delv | lb. | ... | .105 | .105 | .11 | ... ... |
| lcl, drs, delv | lb. | ... | .115 | .115 | .112 | ... ... |
| tech, drs, delv | lb. | ... | .11½ | .10½ | .11½ | .11 .10½ |
| Secondary, tks, delv. | lb. | ... | .08½ | ... | .08½ | ... .08½ |
| c-l, drs, delv | lb. | ... | .09½ | ... | .09½ | ... .09½ |
| tks, delv | lb. | ... | .08½ | ... | .08½ | ... .08½ |
| Chloride, norm, drs, wks | lb. | .56 | .68 | .56 | .68 | .56 .68 |
| mixed, drs, wks | lb. | .0565 | .0665 | .0565 | .077 | .07 .077 |
| tks, wks | lb. | ... | .0465 | .0465 | .06 | ... .06 |
| Mercaptan, drs, wks | lb. | ... | 1.10 | ... | 1.10 | ... 1.10 |
| Oleate, lcl, wks, drs | lb. | ... | .25 | ... | .25 | ... .25 |
| Stearate, lcl, wks, drs | lb. | ... | .26 | ... | .26 | ... .26 |
| Amylene, drs, wks | lb. | .102 | .11 | .102 | .11 | .102 .11 |
| tks, wks | lb. | ... | .09 | ... | .09 | ... .09 |
| Aniline Oil, 960 lb drs and tks | lb. | .14½ | .17½ | .14½ | .17½ | .14½ .17½ |
| Annatto fine | lb. | .34 | .39 | .34 | .39 | .34 .37 |
| Anthracene, 80% | lb. | ... | .55 | .55 | .75 | ... .75 |
| Anthraquinone, sublimed, 125 lb bbls | lb. | ... | .65 | ... | .65 | ... .65 |
| Antimony metal slabs, ton lots | lb. | .14 | nom. | .11¼ | .14 | .10¾ .14 |
| Butter of, see Chloride. | | | | | | |
| Chloride, soln, chys | lb. | | .17 | | .17 | .17 |
| Needle, powd, bbls | lb. | .20 | nom. | .12 | .20 | .12½ .16 |
| Oxide, 500 lb bbls | lb. | .12 | nom. | .10 | .12½ | .11½ .16½ |
| Salt, 63% to 65%, tins | lb. | .38 | nom. | .25¾ | .38 | .26 .27 |
| Archil, conc, 600 lb bbls | lb. | .21 | .27 | .21 | .27 | .21 .27 |
| Double, 600 lb bbls | lb. | .18 | .20 | .18 | .20 | .18 .20 |
| Aroclors, wks | lb. | .18 | .30 | .18 | .30 | .18 .30 |
| Arrowroot, bbls | lb. | 08½ | .09 | .08½ | .09 | .08½ .09 |
| Arsenic, Metal | lb. | ... | ... | .40 | .60 | .40 .44 |
| Red, 224 lb cs kgs | lb. | ... | ... | .15¾ | ... | ... .15¾ |
| White, 112 lb kgs | lb. | .03 | .03¼ | .03 | .03¼ | .03 .04 |

B

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Barium Carbonate precip, 200 lb bgs, wks | ton | 52.50 | 62.50 | 52.50 | 62.50 | 52.50 | 62.50 |
| Nat (witherite) 90% gr, c-l, wks, bgs | ton | 45.00 | 47.00 | 41.00 | 47.00 | 41.00 | 44.00 |
| Chlorate, 112 lb kgs, NY | lb. | .19 | nom. | .16½ | .19 | .16½ | .17½ |
| Chloride, 600 lb bbls, delv, zone 1 | ton | 77.00 | 92.00 | 77.00 | 92.00 | 77.00 | 92.00 |
| Dioxide, 88%, 690 lb drs | lb. | .11 | .12 | .11 | .12 | .11 | .12 |
| Hydrate, 500 lb bbls | lb. | .04½ | .05 | .04½ | .05½ | .04¾ | .05½ |
| Nitrate, bbls | lb. | .10½ | nom. | .06¾ | .10½ | .06¾ | .08¼ |
| Barytes, floated, 350 lb bbls c-l, wks | ton | | 23.65 | | 23.65 | | 23.65 |
| Bauxite, bulk, mines | ton | 7.00 | 10.00 | 7.00 | 10.00 | 7.00 | 10.00 |
| Bentonite, c-l, 325 mesh, bgs, wks | ton | ... | 16.00 | ... | 16.00 | ... | 16.00 |
| 200 mesh | ton | ... | 11.00 | ... | 11.00 | ... | 11.00 |
| Benzaldehyde, tech, 945 lb. drs, wks | lb. | .60 | .62 | .60 | .62 | .60 | .62 |
| Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd | gal. | ... | .16 | ... | .16 | ... | .16 |
| 90% c-l, drs | gal. | ... | .21 | ... | .21 | ... | .21 |
| Ind pure, tks, frt all'd | gal. | ... | .16 | ... | .16 | ... | .16 |
| Benzidine Base, dry, 250 lb bbls | lb. | .70 | .72 | .70 | .72 | .70 | .72 |
| Benzoyl Chloride, 500 lb drs | lb. | .40 | .45 | .40 | .45 | .40 | .45 |
| Benzyl Chloride, 95-97% rfd, drs | lb. | .30 | .40 | .30 | .40 | .30 | .40 |
| Tech, drs | lb. | .25 | .26 | .25 | .26 | .25 | .26 |
| Beta-Naphthol, 250 lb bbls, wks | lb. | .23 | .24 | .23 | .24 | .23 | .24 |
| Naphthylamine, sublimed, 200 lb bbls | lb. | 1.25 | 1.35 | 1.25 | 1.35 | 1.25 | 1.35 |
| Tech, 200 lb bbls | lb. | .51 | .52 | .51 | .52 | .51 | .52 |
| Bismuth metal | lb. | 1.10 | 1.15 | 1.05 | 1.15 | 1.00 | 1.10 |
| Chloride, boxes | lb. | 3.20 | 3.25 | 3.20 | 3.25 | 3.20 | 3.25 |
| Hydroxide, boxes | lb | 3.15 | 3.20 | 3.15 | 3.20 | 3.15 | 3.20 |
| Oxychloride, boxes | lb. | ... | 2.95 | ... | 2.95 | ... | 2.95 |
| Subbenzoate, boxes | lb. | 3.25 | 3.30 | 3.25 | 3.30 | 3.25 | 3.30 |
| Subcarbonate, kgs | lb. | 1.43 | 1.46 | 1.43 | 1.56 | 1.13 | 1.58 |
| Trioxide, powd, boxes | lb. | ... | 3.57 | ... | 3.57 | ... | 3.57 |
| Subnitrate, fibre, drs | lb. | 1.23 | 1.26 | 1.23 | 1.36 | 1.03 | 1.48 |
| Blanc Fixe, 400 lb bbls, wks | ton *h* | 40.00 | 75.00 | 40.00 | 75.00 | 40.00 | 75.00 |
| Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb. | | ... | 2.00 | ... | 2.00 | ... | 2.00 |
| lcl, drs, wks | lb. | 2.25 | 3.60 | 2.25 | 3.60 | 2.25 | 3.60 |
| Blood, dried, f.o.b., NY | unit | ... | 4.25 | 2.50 | 4.25 | 2.50 | 3.25 |
| Chicago, high grade | unit | ... | 4.25 | 2.30 | 4.25 | 2.35 | 3.35 |
| Imported shipt | unit | ... | 3.90 | 2.65 | 3.90 | 2.90 | 3.45 |
| Blues, Bronze Chinese Milori | | | | | | | |
| Prussian Soluble | lb. | .36 | .37 | .36 | .37 | .36 | .37 |
| Ultramarine,* dry, wks, bbls | lb. | ... | .11 | ... | .11 | ... | .11 |
| Regular grade, group 1 | lb. | ... | .16 | ... | .16 | ... | .16 |
| Special, group 1 | lb. | ... | .19 | ... | .19 | ... | .19 |
| Pulp, No. 1 | lb. | ... | .27 | ... | .27 | ... | .27 |
| Bone, 4½ + 50% raw, Chicago | ton | ... | 34.00 | 27.00 | 34.00 | 25.50 | 30.00 |
| Bone Ash, 100 lb kgs | lb. | .06 | .07 | .06 | .07 | .06 | .07 |
| Black, 200 lb bbls | lb. | .06½ | .08¼ | .06½ | .08¼ | .06½ | .08¼ |
| Meal, 3% & 50%, imp | ton | 27.00 | nom. | 22.00 | 27.00 | 20.50 | 23.75 |
| Domestic, bgs, Chicago | ton | ... | 32.00 | 24.00 | 32.00 | 16.00 | 26.00 |
| Borax, tech, gran, 80 ton lots, sacks, delv | ton *i* | ... | 43.00 | ... | 43.00 | 42.00 | 43.00 |
| bbls, delv | ton *i* | ... | 53.00 | ... | 53.00 | 52.00 | 53.00 |

*h* Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

OXALIC
ACID
CRYSTAL • POWDER
With a background of 78 years of service to chemical buyers, Turner offers uniform products of the highest standard at the lowest possible cost.
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Chemicals for Industry

Church & Dwight Co., Inc.

*Established 1846*

70 PINE STREET NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

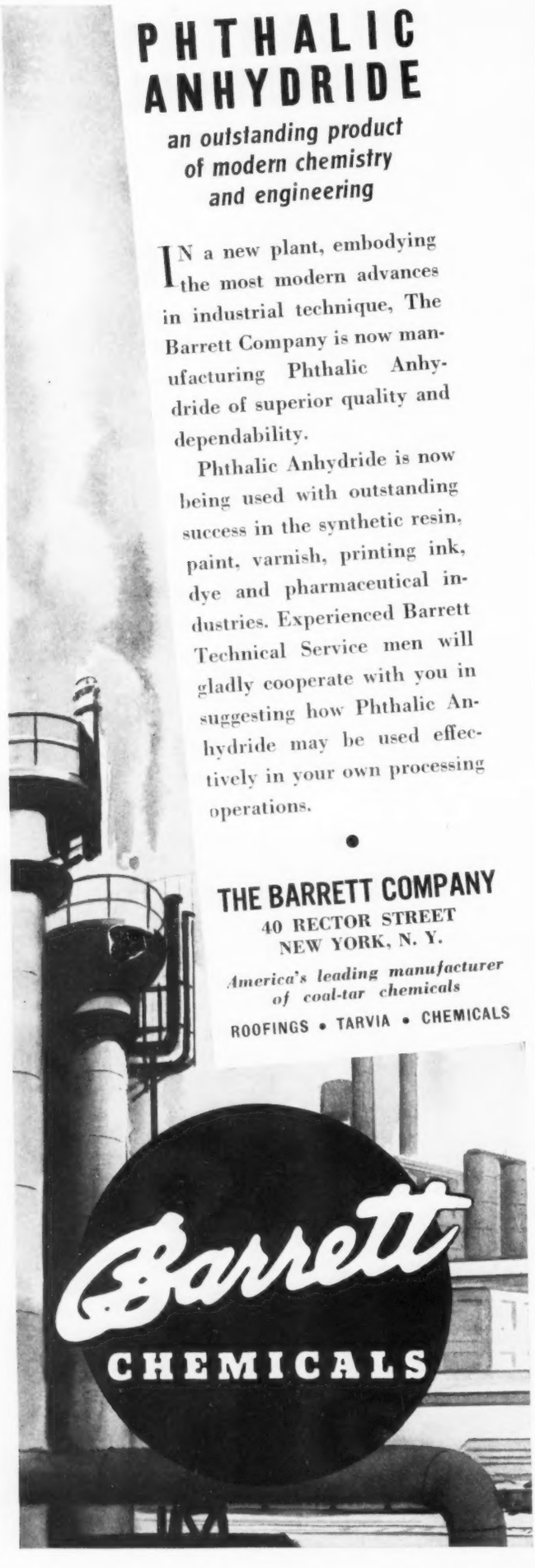
*Standard Quality*

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Borax (continued) | | | | | | |
| Tech, powd, 80 ton lots, sacks | ton *j* | ... 47.00 | ... 47.00 | | ... 47.00 | |
| bbls, del | ton *j* | ... 57.00 | ... 57.00 | | ... 57.00 | |
| Bordeaux Mixture, drs | lb. | .11 .11½ | .11 .11½ | | .11 .11½ | |
| Bromine, cases | lb. | .30 .43 | .30 .43 | | .30 .43 | |
| Bronze, Al, pwd, 300 lb drs | lb. | .90½ .92½ | .90½ .92½ | | .90½ .92½ | |
| Gold, blk | lb. | .45 .65 | .45 .65 | | .45 .65 | |
| Butanes, com 16-32° group 3 tks | lb. | .02¼ .03¾ | .02¼ .03¾ | | .02¼ .03¾ | |
| Butyl, Acetate, norm drs, frt allowed | lb. | ... .08 | .08 .09½ | | .09½ .10½ | |
| tks, frt allowed | lb. | ... .07 | .07 .08½ | | .08½ .09 | |
| Secondary, tks, frt allowed | lb. | ... .05½ | .05½ .06½ | | .06½ .07 | |
| drs, frt allowed | lb. | .065 .07 | .068 .08 | | .07½ .08½ | |
| Aldehyde, 50 gal drs, wks | lb. | .15½ .17½ | .15½ .17½ | | .16½ .17½ | |
| Carbinol, norm drs, wks | lb. | .60 .75 | .60 .75 | | .60 .75 | |
| Crotonate, norm, 55 and 110 gal drs, delv | lb. | ... .35 | .35 .75 | | ... ... | |
| Lactate | lb. | .22½ .23½ | .22½ .23½ | | .22½ .23½ | |
| Oleate, drs, frt allowed | lb. | ... .25 | ... .25 | | ... .25 | |
| Propionate, drs | lb. | .16½ .17 | .16½ .18½ | | .18 .18½ | |
| tks, delv | lb. | ... .15½ | .15½ .17 | | ... .17 | |
| Stearate, 50 gal drs | lb. | ... .26 | ... .26 | | ... .26 | |
| Tartrate, drs | lb. | .55 .60 | .55 .60 | | .55 .60 | |
| Butyraldehyde, drs, lcl, wks | lb. | ... .35½ | ... .35½ | | ... .35½ | |
| **C** | | | | | | |
| Cadmium Metal | lb. | .65 .70 | .50 .85 | | .85 1.60 | |
| Sulfide, orange, boxes | lb. | .75 .85 | .75 .90 | | .80 1.60 | |
| Calcium, Acetate, 150 lb bgs c-l, delv | 100 lb. | ... 1.75 | 1.65 1.75 | | ... 1.65 | |
| Arsenate, c-l, E. of Rockies, dealers, drs | lb. | .06¾ .07¼ | .06¾ .07¼ | | .06¾ .07¼ | |
| Carbide, drs | lb. | .05 .06 | .05 .06 | | .05 .06 | |
| Carbonate, tech, 100 lb bgs c-l | lb. | ... 1.00 | ... 1.00 | | ... 1.00 | |
| Chloride, flake, 375 lb drs, burlap bgs, c-l, delv | ton | ... 22.00 | ... 22.00 | | 22.00 23.50 | |
| paper bgs, c-l, delv | ton | 23.00 36.00 | 23.00 36.00 | | 23.00 36.00 | |
| Solid, 650 lb drs, c-l, delv | ton | ... 20.00 | ... 20.00 | | 20.00 21.50 | |
| Ferrocyanide, 350 lb bbls wks | lb. | ... .17 | ... .17 | | ... .17 | |
| Gluconate, Pharm, 125 lb bbls | lb. | .50 .57 | .50 .57 | | .50 .57 | |
| Levulinate, less than 25 bbl lots, wks | lb. | ... 3.00 | ... 3.00 | | ... 3.00 | |
| Nitrate, 100 lb bgs | ton | ... 28.00 | ... 28.00 | | ... 28.00 | |
| Palmitate, bbls | lb. | .22 .23 | .22 .23 | | .22 .23 | |
| Phosphate, tribasic, tech, 450 lb bbls | lb. | .06½ .07½ | .06½ .07½ | | .06½ .07½ | |
| Resinate, precip, bbls | lb. | .13 .14 | .13 .14 | | .13 .14 | |
| Stearate, 100 lb bbls | lb. | .19 .21 | .19 .21 | | .19 .21 | |
| Camphor, slabs | lb. | .70 .75 | .46 .75 | | .52 .56 | |
| Powder | lb. | .70 .75 | .45 .75 | | .52 .56 | |
| Carbon Bisulfide, 500 lb drs | lb. | .05 .05¼ | .05 .05¼ | | .05 .05¼ | |
| Black, c-l, bgs, delv, price varying with zone† | lb. | .02¾ .03¾ | .02¾ .03¾ | | .027 .0380 | |
| lcl, bgs, f.o.b. whse | lb. | ... .06¼ | ... .06¼ | | .05¾ .06¼ | |
| cartons, f.o.b. whse | lb. | ... .06¼ | ... .06¼ | | ... .06¼ | |
| cases, f.o.b. whse | lb. | .07 | .07 | | ... .07 | |
| Decolorizing, drs, c-l | lb. | .08 .15 | .08 .15 | | .08 .15 | |
| Dioxide, Liq 20-25 lb cyl | lb. | .06 .08 | .06 .08 | | .06 .08 | |
| Tetrachloride, 55 or 110 gal drs, c-l, delv | lb. | .05 .05½ | .05 .05½ | | .05 .06 | |
| Casein, Standard, Dom, grd | lb. | .20 .23 | .07 .23 | | .06½ .13½ | |
| 80-100 mesh, c-l, bgs | lb. | .17½ nom. | .07½ .17½ | | .07 .14 | |
| Castor Pomace, 5½ $NH_3$, c-l, bgs, wks | ton | ... 16.50 | 16.50 18.50 | | 18.50 21.00 | |
| Imported, ship, bgs | ton | ... 18.00 | 18.00 20.00 | | 20.00 21.00 | |
| Celluloid, Scraps, ivory cs | lb. | .12 .15 | .12 .15 | | .12 .15 | |
| Transparent, cs | lb. | ... .20 | ... .20 | | ... .20 | |
| Cellulose, Acetate, 50 lb kgs | lb. | ... .35 | .35 .36 | | .36 .40 | |
| Chalk, dropped, 175 lb bbls | lb. | .02¼ .03¼ | .02¼ .03¼ | | .02¼ .03¼ | |
| Precip, heavy, 560 lb cks | lb. | .02¾ .03¼ | .02¾ .03¼ | | .02¼ .04 | |
| Light, 250 lb cks | lb. | .03¼ .04 | .03¼ .04 | | .03¼ .04 | |
| Charcoal, Hardwood, lump, blk, wks | bu. | ... .15 | ... .15 | | ... .15 | |
| Softwood, bgs, delv* | ton | 25.00 36.00 | 23.00 36.00 | | 23.00 34.00 | |
| Willow, powd, 100 lb bbls, wks | lb. | .06 .07 | .06 .07 | | .06 .07 | |
| Chestnut, clarified, tks, wks | lb. | ... .01½ | ... .01½ | | .01½ .02125 | |
| 25%, bbls, wks | lb. | ... .02 | ... .02 | | .02 .0225 | |
| Pwd, 60%, 100 lb bgs, wks | lb. | ... .04½ | ... .04½ | | .04½ .04⅞ | |
| China Clay, c-l, blk mines | ton | 7.60 | 7.00 7.60 | | 7.00 | |
| Imported, lump, blk | ton | 26.00 nom. | 22.00 26.00 | | 22.00 25.00 | |
| Chlorine, cyls, lcl, wks, contract | lb. | .07½ .08½ | .07½ .08½ | | .07½ .08½ | |
| cyls, c-l, contract | lb. *j* | ... .05¼ | .05¼ .05½ | | .05½ | |
| Liq, tk, wks, contract 100 lb. | | ... 1.75 | 1.75 2.00 | | 2.00 2.15 | |
| Multi, c-l, cyls, wks, cont | lb. | ... 1.90 | 1.90 2.15 | | 2.30 2.55 | |
| Chloroacetophenone, tins, wks | lb. | 3.00 3.50 | 3.00 3.50 | | 3.00 3.50 | |
| Chlorobenzene, Mono, 100 lb drs, lcl, wks | lb. | .06 .07½ | .06 .07½ | | .06 .07½ | |
| Chloroform, tech, 1000 lb drs | lb. | .20 .21 | .20 .21 | | .20 .21 | |
| USP, 25 lb tins | lb. | .30 .31 | .30 .31 | | .30 .31 | |
| Chloropicrin, comml cyls | lb. | .80 | .80 | | .80 | |
| Chrome, Green, CP | lb. | .21 .25 | .21 .25 | | .21 .25 | |
| Yellow | lb. | .14½ .15½ | .14½ .15½ | | .14½ .15½ | |

*j* A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Chromium Acetate, 8% Chrome, bbls | lb. | .05 .08 | .05 .08 | | .05 .08 | |
| Fluoride, powd, 400 lb bbl | lb. | .27 .28 | .27 .28 | | .27 .28 | |
| Coal tar, bbls | bbl. | 7.50 8.00 | 7.50 8.00 | | 7.50 8.00 | |
| Cobalt Acetate, bbls | lb. | .65 .67 | .65 .67 | | .65 .68 | |
| Carbonate tech, bbls | lb. | 1.25 1.60 | 1.25 1.63 | | ... 1.63 | |
| Hydrate, bbls | lb. | ... 1.78 | ... 1.78 | | 1.36 1.78 | |
| Linoleate, solid, bbls | lb. | ... .33 | ... .33 | | ... .33 | |
| paste, 6%, drs | lb. | ... .31 | ... .31 | | ... .31 | |
| Oxide, black, bgs | lb. | ... 1.67 | ... 1.67 | | ... 1.67 | |
| Resinate, fused, bbls | lb. | ... .13½ | ... .13½ | | ... .13½ | |
| Precipitated, bbls | lb. | .34 | ... .34 | | ... .34 | |
| Cochineal, gray or bk bgs | lb. | .35 .38 | .35 .38 | | .35 .38 | |
| Teneriffe silver, bgs | lb. | .36 .39 | .36 .39 | | .36 .39 | |
| Copper, metal, electrol 100 | lb. | ... 12.00 | 10.00 12.00 | | 9.00 11.25 | |
| Acetate, normal, bbls, wks | lb. | .21 .23 | .21 .23 | | .21 .23 | |
| Carbonate, 52-54% 400 lb bbls | lb. | .16½ nom. | .14½ .16½ | | .1340 .16¾ | |
| Chloride, 250 lb bbls | lb. | .16 nom. | .12½ .16 | | .12½ .17 | |
| Cyanide, 100 lb drs | lb. | .34 | ... .34 | | .34 .38 | |
| Oleate, precip, bbls | lb. | .20 | ... .20 | | ... .20 | |
| Oxide, black, bbls, wks | lb. | .18¾ nom. | .15 .18¾ | | .13½ .17¾ | |
| red 100 lb bbls | lb. | .20 nom. | .15¾ .20 | | .15 .19775 | |
| Sub-acetate verdigris, 400 lb bbls | lb. | .18 .19 | .18 .19 | | .18 .19 | |
| Sulfate, bbls, c-l, wks | 100 lb. | ... 4.60 | 4.10 4.60 | | 4.00 4.50 | |
| Copperas, crys and sugar bulk c-l, wks | ton | ... 14.00 | ... 14.00 | | 12.00 14.00 | |
| Corn Sugar, tanners, bbls | 100 lb. | ... 3.14 | 2.89 3.19 | | 2.95 3.30 | |
| Corn Syrup, 42°, bbls | 100 lb. | ... 3.17 | 2.92 3.17 | | 2.89 3.16 | |
| 43°, bbls | 100 lb. | ... 3.22 | 2.97 3.22 | | 2.94 3.21 | |
| Cotton, Soluble, wet, 100 lb bbls | lb. | .40 .42 | .40 .42 | | .40 .42 | |
| Cream Tartar, powd & gran 300 lb bbls | lb. | .25¼ .25¾ | .22¼ .25¾ | | .19¾ .23¼ | |
| Creosote, USP, 42 lb cbys | lb. | .45 .47 | .45 .47 | | .45 .47 | |
| Oil, Grade 1 tks | gal. | .13½ .14 | .13½ .14 | | .13½ .14 | |
| Grade 2 | gal. | .122 .132 | .122 .132 | | .122 .132 | |
| Cresol, USP, drs | lb. | .09½ .10 | .09½ .10½ | | .10 .12½ | |
| Crotonaldehyde, 97%, 55 and 110 gal drs, wks | lb. | .11 .12 | .11 .22* | | .22* .30* | |
| Cutch, Philippine, 100 lb bale | lb. | ... .04 | .04 .04½ | | .04 .06 | |
| Cyanamid, pulv, bags c-l, frt all'w'd, nitrogen basis, unit | | ... 1.27½ | ... ... | | ... ... | |
| **D** | | | | | | |
| Derris root 5% rotenone, bbls | lb. | .24 .30 | .24 .30 | | .34 .43 | |
| Dextrin, corn, 140 lb bgs f.o.b., Chicago | 100 lb. | 3.55 3.75 | 3.30 3.75 | | 3.30 3.75 | |
| British Gum, bgs | 100 lb. | 3.80 3.90 | 3.55 3.95 | | 3.55 4.00 | |
| Potato, Yellow, 220 lb bgs | lb. | .07⅜ .07¾ | .07 .08¾ | | .07¼ .08¾ | |
| White, 220 lb bgs, lcl | lb. | .08½ .09 | .08 .09 | | .08 .09 | |
| Tapioca, 200 bgs, lcl | lb. | .0715 | ... .0715 | | .0715 .08 | |
| White, 140 lb bgs | 100 lb. | 3.50 3.70 | 3.25 3.70 | | 3.30 3.70 | |
| Diamylamine, c-l, drs, wks | lb. | ... .47 | ... .47 | | .47 .75 | |
| l.c.l. drs, wks | lb. | ... .50 | ... ... | | ... ... | |
| tks, wks | lb. | ... .45 | ... ... | | ... ... | |
| Diamylene, drs, wks | lb. | .095 .102 | .095 .102 | | .095 .102 | |
| tks, wks | lb. | ... .08½ | ... .08½ | | ... .08½ | |
| Diamylether, wks, drs | lb. | .085 .092 | .085 .092 | | .085 .092 | |
| tks, wks | lb. | ... .075 | ... .075 | | ... .075 | |
| Oxalate, lcl, drs, wks | lb. | ... .30 | ... .30 | | ... .30 | |
| Diamylphthalate, drs, wks | lb. | .21 .21½ | .19 .21 | | .19 .21 | |
| Diamyl Sulfide, drs, wks | lb. | ... 1.10 | ... 1.10 | | ... 1.10 | |
| Diatomaceous Earth, see Kieselguhr. | | | | | | |
| Dibutoxy Ethyl Phthalate, drs, wks | lb. | ... .35 | ... .35 | | ... .35 | |
| Dibutylamine, lcl, drs, wks | lb. | ... .53 | .53 .55 | | ... .55 | |
| c.l. drs, wks | lb. | ... .50 | ... ... | | ... ... | |
| tks, wks | lb. | ... .48 | ... ... | | ... ... | |
| Dibutyl Ether, drs, wks, lcl | lb. | .24½ .25 | .24½ .25 | | .25 .30 | |
| Dibutylphthalate, drs, wks, frt all'd | lb. | .19 .19½ | .19 .19½ | | .19 .21 | |
| Dibutyltartrate, 50 gal drs | lb. | ... .50 | .45 .54 | | .45 .54 | |
| Dichlorethylene, drs | lb. | ... .25 | ... .25 | | ... .25 | |
| Dichloroethylether, 50 gal drs, wks | lb. | .15 .16 | .15 .16 | | .15 .16 | |
| tks, wks | lb. | ... .14 | ... .14 | | ... .14 | |
| Dichloromethane, drs, wks | lb. | ... .23 | ... .23 | | ... .23 | |
| Dichloropentanes, drs, wks | lb. | no prices | no prices | | ... ... | |
| tks, wks | lb. | no prices | no prices | | ... ... | |
| Diethanolamine, tks, wks | lb. | ... .23 | ... .23 | | ... .23 | |
| Diethylamine, 400 lb drs | lb. | 2.75 3.00 | 2.75 3.00 | | 2.75 3.00 | |
| Diethylaniline, 850 lb drs | lb. | .40 .52 | .40 .52 | | .40 .50 | |
| Diethyl Carbinol, drs | lb. | .60 .75 | .60 .75 | | .60 .75 | |
| Diethylcarbonate, com drs | lb. | .31¾ .35 | .31¾ .35 | | .31¾ .35 | |
| Diethylorthotoluidin, drs | lb. | .64 .67 | .64 .67 | | .64 .67 | |
| Diethylphthalate, 1000 lb drs | lb. | .19 .19½ | .19 .19½ | | .19 .19½ | |
| Diethylsulfate, tech, drs, wks, lcl | lb. | .13 .14 | .13 .14 | | .13 .14 | |
| Diethyleneglycol, drs | lb. | .16 .17 | .16 .17 | | .16 .17 | |
| Mono ethyl ethers, drs | lb. | .15 .16 | .15 .16 | | .15 .16 | |
| tks, wks | lb. | .14 | ... .14 | | ... .14 | |
| Mono butyl ether, drs | lb. | .23 .24 | .23 .24 | | .23 .24 | |
| tks, wks | lb. | ... .22 | ... .22 | | ... .22 | |
| Diethylene oxide, 50 gal drs, wks | lb. | .20 .24 | .20 .24 | | .20 .24 | |
| Diglycol Laurate, bbls | lb. | .16 .17 | .16 .23 | | ... .27½ | |
| Oleate, bbls | lb. | ... .13 | 13 20 | | ... .21 | |
| Stearate, bbls | lb. | ... .20 | .20 .28 | | ... .27½ | |
| Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis | lb. | ... 1.00 | ... 1.00 | | ... 1.00 | |
| Dimethylaniline, 340 lb drs | lb. | .23 .24 | .23 .24 | | .23 .27 | |
| Dimethyl Ethyl Carbinol, drs | lb. | .60 .75 | .60 .75 | | .60 .75 | |

*k* Higher price is for purified material; * These prices were on a delivered basis.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**Dimethyl Phthalate**
**Glauber's Salt**

## Prices

| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Dimethyl phthalate, drs, wks, frt allowed ....lb. | ... | .19 | ... | .19 | ... | .19 |
| Dimethylsulfate, 100 lb drs lb. | .45 | .50 | .45 | .50 | .45 | .50 |
| Dinitrobenzene, 400 lb bbls lb. *k* | .18 | .19 | .16 | .19 | .16 | .19 |
| Dinitrochlorobenzene, 400 lb bbls ....lb. | ... | .14 | .13½ | .14 | .13½ | .14 |
| Dinitronaphthalene, 350 lb bbls ....lb. | .35 | .38 | .35 | .38 | .35 | .38 |
| Dinitrophenol, 350 lb bbls lb. | .22 | .23 | .22 | .24 | .23 | .24 |
| Dinitrotoluene, 300 lb bbls lb. | ... | .15½ | ... | .15½ | ... | .15½ |
| Diphenyl, bbls ....lb. | .15 | .25 | .15 | .25 | .15 | .25 |
| Diphenylamine ....lb. | .31 | .32 | .32 | .32 | .31 | .32 |
| Diphenylguanidine, 100 lb drs ....lb. | .35 | .37 | .31 | .37 | .31 | .32 |
| Dip Oil, see Tar Acid Oil. | | | | | | |
| Divi Divi pods, bgs shipmt ton | ... | nom. | | nom. | ... | nom. |
| Extract ....lb. | .05¾ | .06¾ | .05¾ | .06¾ | .05 | .06¾ |
| **E** | | | | | | |
| Egg Yolk, dom., 200 lb cases lb. | .62 | .64 | .59 | .69 | .60 | .69 |
| Epsom Salt, tech, 300 lb bbls c-l, NY ....100 lb. | 1.90 | 2.10 | 1.90 | 2.10 | 1.90 | 2.10 |
| USP, c-l, bbls ....100 lb. | ... | 2.10 | ... | 2.10 | ... | 2.10 |
| Ether, USP anaesthesia 55 lb drs ....lb. | .22 | .23 | .22 | .23 | .22 | .23 |
| (Conc) ....lb. | .09 | .10 | .09 | .10 | .09 | .10 |
| Isopropyl 50 gal drs ...lb. | .07 | .08 | .07 | .08 | .07 | .08 |
| tks, frt allowed ....lb. | ... | .06 | ... | .06 | ... | .06 |
| Nitrous conc bottles ...lb. | ... | .68 | ... | .68 | ... | .68 |
| Synthetic, wks, drs ...lb. | .08 | .09 | .08 | .09 | .08 | .09 |
| Ethyl Acetate, 85% Ester tks, frt all'd ....lb. | ... | .051 | ... | .051 | .051 | .05½ |
| drs, frt all'd ....lb. | ... | .061 | .. | .061 | .061 | .06½ |
| 99%, tks, frt all'd ...lb. | ... | .0585 | ... | .0585 | .0585 | .06¾ |
| drs, frt all'd ....lb. | ... | .0685 | ... | .0685 | .0685 | .07¾ |
| Acetoacetate, 110 gal drs lb. | ... | .27½ | ... | .27½ | ... | .27½ |
| Benzylaniline, 300 lb drs lb. | .86 | .88 | .86 | .88 | .86 | .88 |
| Bromide, tech, drs ....lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Cellulose, drs, wks, frt all'd ....lb. | .45 | .50 | .45 | .50 | .45 | 1.00 |
| Chloride, 200 lb drs ...lb. | .22 | .24 | .22 | .24 | .22 | .24 |
| Chlorocarbonate, cbys ..lb. | ... | .30 | ... | .30 | | .30 |
| Crotonate, drs ....lb. | ... | .35 | .35 | .75 | 1.00 | 1.25 |
| Formate, drs, frt all'd..lb. | .27 | .28 | .27 | .28 | .27 | .28 |
| Lactate, drs, wks ....lb. | ... | .33 | ... | .33 | ... | .33 |
| Oxalate, drs, wks ....lb. | .30 | .34 | .30 | .34 | .30 | .34 |
| Oxybutyrate, 50 gal drs, wks ....lb. | .30 | .30½ | .30 | .30½ | .30 | .30½ |
| Silicate, drs, wks ....lb. | ... | .77 | ... | .77 | ... | .77 |
| Ethylene Dibromide, 60 lb drs ....lb. | .65 | .70 | .65 | .70 | .65 | .70 |
| Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb. | .75 | .85 | .75 | .85 | .75 | .85 |
| Anhydrous ....lb. | ... | .75 | ... | .75 | ... | .75 |
| Dichloride, 50 gal drs, wks lb. | .0545 | .0994 | .0545 | .0994 | .0545 | .0994 |
| Glycol, 50 gal drs, wks ..lb. | .16 | .20 | .16 | .21 | .17 | .21 |
| tks, wks ....lb. | ... | .15 | .15 | .16 | ... | .16 |
| Mono Butyl Ether, drs, wks ....lb. | .18 | .22 | .18 | .22 | .20 | .21 |
| tks, wks ....lb. | ... | .17 | .17 | .19 | ... | .19 |
| Mono Ethyl Ether, drs, wks ....lb. | .15 | .16 | .15 | .17 | .16 | .17 |
| tks, wks ....lb. | ... | .14 | ... | .15 | ... | .15 |
| Mono Ethyl Ether Acetate, drs, wks ....lb. | .13 | .14 | .13 | .14 | ... | .14 |
| tks, wks ....lb. | ... | .12 | .12 | .13 | ... | .13 |
| Mono Methyl Ether, drs wks ....lb. | .17 | .18 | .17 | .22 | .18 | .22 |
| tks, wks ....lb. | ... | .16 | .. | .17 | ... | .17 |
| Oxide, cyl ....lb. | .50 | .55 | .50 | .55 | .50 | .55 |
| Ethylideneaniline ....lb. | .45 | .47½ | .45 | .47½ | .45 | .47½ |
| **F** | | | | | | |
| Feldspar, blk pottery ....ton | 17.00 | 19.00 | 17.00 | 19.00 | 17.00 | 19.00 |
| Powd, blk, wks ....ton | 14.00 | 14.50 | 14.00 | 14.50 | 14.00 | 14.50 |
| Ferric Chloride, tech, crys, 475 lb bbls ....lb. | .05 | .07½ | .05 | .07½ | .05 | .07½ |
| sol, 42° cbys ....lb. | .06¼ | .06½ | .06¼ | .06½ | .06¼ | .06½ |
| Fish Scrap, dried, unground wks ....unit *l* | ... | 4.25 | 3.00 | 4.25 | 2.75 | 3.30 |
| Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis ....unit *m* | ... | 3.00 | 2.35 | 3.00 | 2.50 | 2.50 |
| Fluorspar, 98% bgs ....lb. | ... | 31.60 | 30.00 | 33.00 | .... | 33.00 |
| Formaldehyde, USP, 400 lb bbls, wks ....lb. | .05¾ | .06¼ | .05¾ | .06¼ | .05¾ | .06¼ |
| Fossil Flour ....lb. | .02½ | .04 | .02½ | .04 | .02½ | .04 |
| Fullers Earth, blk, mines ton | 10.00 | 11.00 | 10.00 | 11.00 | 10.00 | 11.00 |
| Imp powd, c-l, bgs ...ton | 23.00 | 30.00 | 23.00 | 30.00 | 23.00 | 30.00 |
| Furfural (tech) drs, wks lb. | .10 | .15 | .10 | .15 | .10 | .15 |
| Furfuramide (tech) 100 lb. drs ....lb. | ... | .30 | ... | .30 | ... | .30 |
| Fusel Oil, 10% impurities lb. | .12½ | .14 | .12½ | .14 | .12½ | .14 |
| Fustic, crystals, 100 lb boxes ....lb. | .22 | .26 | .22 | .26 | .22 | .26 |
| Liquid 50°, 600 lb bbls lb. | .09½ | .13 | .09½ | .13 | .09½ | .13 |
| Solid, 50 lb boxes ....lb. | .17½ | .19½ | .17½ | .19½ | .17½ | .19½ |
| **G** | | | | | | |
| G Salt paste, 360 lb bbls..lb. | .45 | .47 | .45 | .47 | .45 | .47 |
| Gambier, com 200 lb bgs lb. | ... | ... | .06¾ | .07¼ | .06¾ | .07¼ |
| Singapore cubes, 150 lb bgs ....100 lb. | ... | ... | .08 | .09½ | .08½ | .11 |
| Gelatine, tech, 100 lb cs ..lb. | .42 | .43 | .42 | .50 | .45 | .50 |
| Glauber's Salt, tech, c-l, bgs, wks* ....100 lb. | .95 | 1.18 | .95 | 1.18 | .95 | 1.15 |
| Anhydrous, see Sodium Sulfate | | | | | | |

*l* + 10; *m* + 50; * Bbls. are 20c higher.

| | | Current Market | | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|---|
| Glue, bone, com grades, c-l bgs | lb. | .12½ | .14½ | .11¼ | .14½ | .13 | .16½ |
| Better grades, c-l, bgs | lb. | .16 | .18 | .15 | .18 | .14½ | .16½ |
| Glycerin, CP, 550 lb drs | lb. | ... | .12½ | ... | .12½ | .12½ | .16 |
| Dynamite, 100 lb drs. | lb. | ... | nom. | ... | .09 | .12¼ | .16 |
| Saponification, drs | lb. | .09 | .10 | .08½ | .10 | .08½ | .11¼ |
| Soap Lye, drs | lb. | .07¾ | .07⅞ | .07½ | .07⅞ | .07½ | .10¼ |
| Glyceryl Bori-Borate, bbls | lb. | ... | .40 | ... | .40 | ... | .40 |
| Monoricinoleate, bbls | lb. | ... | .27 | ... | .27 | ... | .27 |
| Monostearate, bbls | lb. | ... | .30 | ... | .30 | ... | .30 |
| Oleate, bbls | lb. | ... | .22 | ... | .22 | ... | .22 |
| Phthalate | lb. | ... | .37 | ... | .37 | ... | .37 |
| Glyceryl Stearate, bbls | lb. | ... | .18 | ... | .18 | ... | .18 |
| Glycol Bori-Borate, bbls. | lb. | ... | .22 | .22 | .23 | ... | .26 |
| Phthalate, drs | lb. | ... | .38 | .38 | .40 | ... | .40 |
| Stearate, drs | lb. | ... | .24 | .24 | .27½ | ... | .27½ |
| **GUMS** | | | | | | | |
| Gum Aloes, Barbadoes | lb | .85 | .90 | .85 | .90 | .85 | .90 |
| Arabic, amber sorts | lb. | .19 | nom. | .09 | .19 | .09 | .12 |
| White sorts, No. 1, bgs | lb. | .28 | .35 | .23 | .35 | .23 | .28 |
| No. 2, bgs | lb. | .27 | .34 | .21 | .34 | .21 | .26 |
| Powd, bbls | lb. | .22 | nom. | .12½ | .22 | .12 | .16 |
| Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b., NY | lb. | .02½ | .10½ | .02½ | .10½ | .02½ | .10½ |
| California, f.o.b. NY, drs | ton | 29.00 | 55.00 | 29.00 | 55.00 | 29.00 | 55.00 |
| Egyptian, 200 lb cases, f.o.b. NY | lb. | .12 | .15 | .12 | .15 | .12 | .15 |
| Benzoin Sumatra, USP, 120 lb cases | lb. | .33 | .34 | .17 | .34 | .15 | .25 |
| Copal, Congo, 112 lb bgs, clean, opaque | lb. | .23½ | nom. | .18¼ | .23½ | .18¾ | .19¼ |
| Dark amber | lb. | .09⅞ | nom. | .07⅛ | .09⅞ | .07⅛ | .08⅞ |
| Light amber | lb. | .15⅜ | nom. | .11¼ | .15⅜ | .11¼ | .13¼ |
| Copal, East India, 180 lb bgs Macassar pale bold | lb. | .15¼ | nom. | .11⅜ | .15¼ | .11⅜ | .13 |
| Chips | lb. | .08½ | nom. | .05⅜ | .08½ | ... | .05⅜ |
| Dust | lb. | .07⅛ | nom. | .03¼ | .07⅛ | .03½ | .04⅛ |
| Nubs | lb. | .13¾ | nom. | .09½ | .13¾ | .09⅛ | .10⅜ |
| Singapore, Bold | lb. | .18¼ | nom. | .14 | .18¼ | .14½ | .15¼ |
| Chips | lb | .10¼ | nom. | .05⅝ | .10¼ | .04¾ | .05⅜ |
| Dust | lb. | .07⅛ | nom. | .03¼ | .07⅛ | .03¼ | .04⅛ |
| Nubs | lb. | .14⅜ | .09⅝ | .09⅝ | .14⅜ | .10 | .10⅜ |
| Copal Manila, 180-190 lb baskets, Loba A | lb. | .13⅜ | nom. | .10½ | .13⅜ | .10½ | .12 |
| Loba B | lb. | .13 | nom. | .09¾ | .13 | .10¼ | .11⅝ |
| Loba C | lb. | .12⅝ | nom. | .09 | .12⅝ | .09¾ | .11¼ |
| DBB | lb. | .11 | nom. | .07⅞ | .11 | .07⅞ | .08¾ |
| Dust | lb. | .07¾ | nom. | .05⅛ | .07¾ | .05⅛ | .06⅝ |
| MA sorts | lb. | .09⅜ | nom. | .05⅞ | .09⅜ | .05⅞ | .07¼ |
| Copal Pontianak, 224 lb cases, bold genuine | lb. | .18½ | nom. | .15¼ | .18½ | .15¼ | .16½ |
| Chips | lb. | .11½ | nom. | .07⅛ | .11½ | .08¼ | .10¼ |
| Mixed | lb. | .16⅝ | nom. | .13⅜ | .16⅝ | ... | .14 |
| Nubs | lb. | .14⅝ | nom. | .10½ | .14⅜ | .11¾ | .12⅞ |
| Split | lb. | .16⅞ | nom. | .12 | .16⅞ | .13½ | .13⅞ |
| Damar Batavia, 136 lb cases A | lb. | .23¾ | nom. | .20 | .22¾ | .20 | .25½ |
| B | lb. | .21⅞ | nom. | .18½ | .21⅞ | .18½ | .24 |
| C | lb. | .15⅝ | nom. | .13½ | .15⅝ | .14⅞ | .20⅜ |
| D | lb. | .14¼ | nom. | .12¼ | .14¼ | .13⅜ | .17½ |
| A/D | lb. | .15¼ | nom. | .12¾ | .15¼ | .14½ | .20⅜ |
| A/E | lb. | .13¾ | nom. | .11⅜ | .13¾ | .12¼ | .17¼ |
| E | lb. | .09⅝ | nom. | .07⅜ | .09⅝ | .07⅜ | .08½ |
| F | lb. | .08¾ | nom. | .07¼ | .08¾ | ... | .07¼ |
| Singapore, No. 1 | lb. | .19½ | nom. | .13¼ | .19½ | .15¼ | .21⅛ |
| No. 2 | lb. | .16¾ | nom. | .10½ | .16¾ | .10⅜ | .15⅜ |
| No. 3 | lb. | .09⅛ | nom. | .05¼ | .09⅛ | .05 | .05¾ |
| Chips | lb. | .12½ | nom. | .09¼ | .12½ | .09¼ | .13½ |
| Dust | lb. | .09⅛ | nom. | .05¼ | .09⅛ | .05 | .05¾ |
| Seeds | lb. | .10½ | nom. | .07⅜ | .10½ | .07⅜ | .09½ |
| Elemi, cns, c-l, | lb. | .13 | nom. | .08⅛ | nom. | .08⅛ | .09½ |
| Ester | lb | .06¼ | .07 | .06 | .07 | .06¼ | .08½ |
| Gamboge, pipe, cases | lb. | .75 | .80 | .55 | .80 | .60 | .80 |
| Powd, bbls | lb. | .80 | .85 | .60 | .85 | .65 | .85 |
| Ghatti, sol. bgs | lb. | .11 | .15 | .11 | .15 | .11 | .15 |
| Karaya, bbls, bxs, drs, | lb. | .14 | .33 | .14 | .33 | ... | ... |
| Kauri, NY Brown XXX, cases | lb. | .60 | nom. | .60 | .60½ | .60 | .60½ |
| BX | lb. | .38 | nom. | ... | .38 | ... | .38 |
| B1 | lb. | .28 | nom. | ... | .28 | ... | .28 |
| B2 | lb. | .24 | nom. | ... | .24 | ... | .24 |
| B3 | lb. | .18½ | nom. | ... | .18½ | ... | .18½ |
| Pale XXX | lb. | .61 | nom. | ... | .61 | ... | .61 |
| No. 1 | lb. | .41 | nom. | ... | .41 | ... | .41 |
| No. 2 | lb. | .24 | nom. | ... | .24 | ... | .24 |
| No. 3 | lb. | .17¼ | nom. | ... | .17¼ | ... | .17¼ |
| Kino, tins | lb. | 3.50 | nom. | 2.50 | 3.50 | 2.00 | 2.75 |
| Mastic | lb. | .70 | nom. | .55 | .70 | .55 | .56 |
| Sandarac, prime quality, 200 lb bgs & 300 lb cks. | lb. | .37 | nom. | .15 | .37 | .19 | .26 |
| Senegal, picked bags | lb. | .30 | nom. | .25 | .30 | .23 | .27 |
| Sorts | lb. | .13 | nom. | .09¼ | .13 | .09¼ | .12 |
| Thus, bbls | 280 lbs. | 14.50 | 14.75 | 13.50 | 14.75 | 13.50 | 14.25 |
| Tragacanth, No. 1, cases | lb. | 2.50 | nom. | 2.25 | 2.50 | 2.40 | 3.00 |
| No. 2 | lb. | 2.40 | nom. | 1.90 | 2.40 | 2.30 | 2.75 |
| No. 3 | lb. | 2.25 | nom. | 1.60 | 2.25 | 1.90 | 2.70 |
| Yucca, bgs | lb. | .08 | nom. | .03½ | .08 | .03½ | .04½ |
| **H** | | | | | | | |
| Helium, cyl (200 cu. ft.) | cyl. | ... | 25.00 | ... | 25.00 | ... | 25.00 |
| Hematine crystals, 400 lb bbls | lb. | .18 | .34 | .18 | .34 | .18 | .34 |
| Hemlock, 25%, 600 lb bbls. wks | lb. | .03⅛ | .03⅜ | .03 | .03⅜ | .03 | .03¼ |
| tks | lb. | ... | .02¾ | .02⅝ | .02¾ | .02⅝ | .02¾ |


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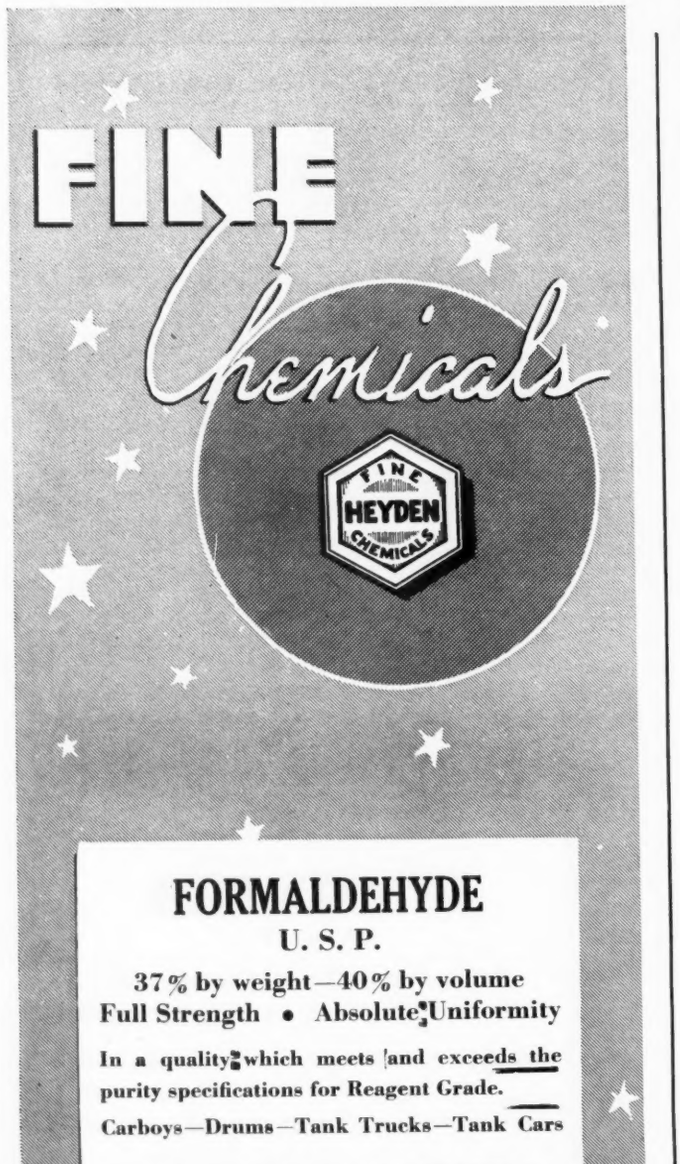




| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Hexalene, 50 gal drs, wks lb. | ... .30 | ... | .30 | ... | .30 |
| Hexane, normal 60-70° C. Group 3, tks ..... gal. | ... .10½ | ... | .10½ | ... | .10½ |
| Hexamethylenetetramine, powd, drs ..... lb. | .32 .33 | .32 | .36 | .35 | .36 |
| Hexyl Acetate, secondary, delv, drs ..... lb. | .13 .13½ | .13 | .13½ | .13 | .13½ |
| tks ..... lb. | ... .12 | | .12 | | .12 |
| Hoof Meal, f.o.b. Chicago unit | ... 3.25 | 2.50 | 3.25 | 2.35 | 3.35 |
| Hydrogen Peroxide, 100 vol, 140 lb cbys ..... lb. | .19½ .20 | .19½ | .20 | .19½ | .20 |
| Hydroxylamine Hydrochloride ..... lb. | ... 3.15 | ... | 3.15 | ... | 3.15 |
| Hypernic, 51°, 600 lb bbls lb. | .13 .16 | .13 | .21 | .16 | .21 |
| **I** | | | | | |
| Indigo, Bengal, bbls ..... lb. | ... 2.40 | ... | 2.40 | ... | 2.40 |
| Synthetic, liquid ..... lb. | .16½ .19 | .16½ | .19 | .16½ | .19 |
| Iodine, Resublimed, jars lb. | ... 1.75 | ... | 1.75 | 1.50 | 1.75 |
| Irish Moss, ord, bales ... lb. | .10 .11 | .10 | .11 | .10 | .11 |
| Bleached, prime, bales lb. | .19 .20 | .19 | .20 | .19 | .20 |
| Iron Acetate Liq. 17°, bbls delv ..... lb. | .03 .04 | .03 | .04 | .03 | .04 |
| Chloride see Ferric Chloride. | | | | | |
| Nitrate, coml, bbls ... 100 lb. | 2.32 3.11 | 2.32 | 3.11 | 2.32 | 3.11 |
| Isobutyl Carbinol (128-132° C) drs, wks ..... lb. | .33 .34 | .33 | .34 | .33 | .34 |
| tks, wks ..... lb. | ... .32 | ... | .32 | ... | .32 |
| Isopropyl Acetate, tks, frt all'd ..... lb. | ... .0510 | ... | .0510 | .0510 | .05½ |
| drs, frt all'd lb. | .061 .066 | .061 | .066 | .061 | .07 |
| Ether, see Ether, isopropyl. | | | | | |
| Keiselguhr, dom bags, c-l, Pacific Coast ..... ton | 22.00 85.00 | 22.00 | 85.00 | 22.00 | 85.00 |
| **L** | | | | | |
| Lead Acetate, f.o.b. NY, bbls, White, broken ..... lb. | ... .11 | .10 | .11 | .10 | .11 |
| cryst, bbls ..... lb. | ... .11 | .10 | .11 | .10 | .11 |
| gran, bbls ..... lb. | ... .11¾ | .10¾ | .11¾ | .10¾ | .11¾ |
| powd, bbls ..... lb. | ... .11¾ | .10¾ | .11¾ | .10¾ | .11¾ |
| Arsenate, East, drs ... lb. | ... .11 | .10 | .11½ | .11 | .13½ |
| Linoleate, solid, bbls ... lb. | ... .19 | | .19 | | .19 |
| Metal, c-l, NY ..... 100 lb. | 5.05 5.10 | 4.75 | 5.10 | 4.00 | 5.10 |
| Nitrate, 500 lb bbls, wks lb. | .11 .12 | .10 | .12 | .10 | .11½ |
| Oleate, bbls ..... lb. | .18½ .20 | .18½ | .20 | .18½ | .20 |
| Red, dry, 95% $Pb_3O_4$, delv ..... lb. | ... .08½ | .07¼ | .08½ | .06½ | .08 |
| 97% $Pb_3O_4$, delv ... lb. | ... .0835 | .07½ | .0835 | .06¾ | .081 |
| 98% $Pb_3O_4$, delv ... lb. | ... .0860 | .07¾ | .0860 | .07 | .0835 |
| Resinate, precip, bbls ... lb. | ... .16½ | | .16½ | | .16½ |
| Stearate, bbls ..... lb. | ... .25 | .22 | .25 | .22 | .23 |
| Titanate, bbls, c-l, f.o.b. wks, frt all'd ..... lb. | .11 .11½ | .11 | .11½ | .11 | .11½ |
| White, 500 lb bbls, wks lb. | ... .07 | ... | .07 | .06 | .07 |
| Basic sulfate, 500 lb bbls, wks ..... lb. | ... .06¼ | ... | .06¼ | .05¼ | .06¼ |
| Lime, chemical quicklime, f.o.b., wks, bulk ... ton | 7.00 8.00 | 7.00 | 8.00 | 7.00 | 8.00 |
| Hydrated, f.o.b. wks ... ton | 8.50 12.00 | 8.50 | 12.00 | 8.50 | 12.00 |
| Lime Salts, see Calcium Salts | | | | | |
| Lime sulfur, dealers, tks .. gal. | .08 .11½ | .08 | .11½ | .08 | .11½ |
| drs ..... gal. | .11 .16 | .11 | .16 | .11 | .16 |
| Linseed Meal, bgs ..... ton | ... 42.00 | 37.50 | 42.00 | 39.00 | 45.00 |
| Litharge, coml, delv, bbls lb. | ... .0685 | .06¼ | .0685 | .05½ | .066 |
| Lithopone, dom, ordinary, delv, bgs ..... lb. | ... .03¾ | .03¾ | .04⅛ | .04⅛ | .04⅝ |
| bbls ..... lb. | ... .04 | .04 | .04⅛ | .04⅛ | .04⅞ |
| High strength, bgs .... lb. | ... .05¼ | .05¼ | .05⅝ | .05⅝ | .06⅛ |
| bbls ..... lb. | ... .05½ | .05½ | .05⅞ | .05⅞ | .06⅜ |
| Titanated, bgs ..... lb. | ... .05¼ | .05¼ | .05⅝ | .05⅝ | .06⅛ |
| bbls ..... lb. | ... .05½ | .05½ | .05⅞ | .05⅞ | .06⅜ |
| Logwood, 51°, 600 lb bbls lb. | .09½ .11½ | .09½ | .11½ | .09½ | .11½ |
| Solid, 50 lb boxes ..... lb. | .15 .19 | .15 | .19 | .15 | .19 |
| Sticks ..... ton | 24.00 25.00 | 24.00 | 25.00 | 24.00 | 25.00 |
| **M** | | | | | |
| Madder, Dutch ..... lb. | .22 .25 | .22 | .25 | .22 | .25 |
| Magnesite, calc, 500 lb bbls ton | 60.00 65.00 | 60.00 | 65.00 | 60.00 | 65.00 |
| Magnesium Carb, tech, 70 lb bgs, wks ..... lb. | ... .06¼ | .05¾ | .06½ | .05¾ | .07 |
| Chloride flake, 375 lb drs, c-l, wks ..... ton | 39.00 42.00 | 39.00 | 42.00 | 39.00 | 42.00 |
| Fluosilicate, crys, 400 lb bbls, wks ..... lb. | .10 .10½ | .10 | .10½ | .10 | .10½ |
| Oxide, calc tech, heavy bbls, frt all'd ..... lb. | .25 .30 | .25 | .30 | .25½ | .30½ |
| Light, bbls above basis lb. | .20 .25 | .20 | .25 | .20 | .25½ |
| USP Heavy, bbls, above basis ..... lb. | .25 .30 | .25 | .30 | .25 | .30½ |
| Palmitate, bbls ..... lb. | .33 nom. | .33 | nom. | | .33 |
| Silicofluoride, bbls .... lb. | .10 .10½ | .09½ | .10½ | .09½ | .10½ |
| Stearate, bbls ..... lb. | .21 .24 | .21 | .24 | .21 | .24 |
| Manganese acetate, drs ... lb. | ... .26½ | ... | .26½ | ... | .26½ |
| Borate, 30%, 200 lb bbls lb. | .15 .16 | .15 | .16 | .15 | .16 |
| Chloride, 600 lb cks ... lb. | .08¼ .08¾ | .07½ | .12 | .09 | .12 |
| Dioxide, tech (peroxide), paper bags, c-l ..... ton | ... 57.50 | 47.50 | 57.50 | 47.50 | 62.50 |
| Hydrate, bbls ..... lb. | ... .32 | ... | .32 | ... | .32 |
| Linoleate, liq, drs ..... lb. | .18 .19¼ | .18 | .19¼ | .18 | .19¼ |
| solid, precip, bbls ... lb. | .19 | | .19 | | .19 |
| Resinate, fused, bbls ... lb. | .08¼ .08½ | .08¼ | .08½ | .08¼ | .08½ |
| precip, drs ..... lb. | ... .12 | ... | .12 | ... | .12 |
| Sulfate, tech, anhyd, 90-95%, 550 lb drs ... lb. | .07 .07½ | .07 | .07½ | .07 | .07½ |

| | Current Market | | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Mangrove, 55%, 400 lb bbls lb. | ... | ... | ... | .04 | ... | .04 |
| Bark, African ....ton | ... | ... | 23.00 | 26.00 | 23.00 | 24.50 |
| Mannitol, pure cryst, cs,wks lb. | .95 | 1.00 | .95 | 1.20 | 1.15 | 1.45 |
| commercial grd, 250 lb bbl ....lb. | .42 | .50 | .42 | .57 | ... | ... |
| Marble Flour, blk ....ton | 12.00 | 14.00 | 12.00 | 14.00 | 12.00 | 13.00 |
| Mercury chloride(Calomel) lb. | | 1.52 | 1.36 | 1.52 | 1.18 | 1.59 |
| Mercury metal...76 lb. flasks | 150.00 | 160.00 | 95.00 | 170.00 | 73.00 | 84.50 |
| Mesityl Oxide, f.o.b. dest., tks. ....lb. | ... | .10½ | .10½ | .20 | ... | ... |
| drs, c.l. ....lb. | ... | .11½ | .11½ | .21 | ... | ... |
| drs, l.c.l. ....lb. | | .12 | .12 | .21½ | ... | ... |
| Meta-nitro-aniline ....lb. | .67 | .69 | .67 | .69 | .67 | .69 |
| Meta-nitro-paratoluidine 200 lb bbls ....lb. | 1.30 | 1.40 | 1.30 | 1.55 | 1.45 | 1.55 |
| Meta-phenylene diamine 300 lb bbls ....lb. | .80 | .84 | .80 | .84 | .80 | .84 |
| Meta-toluene-diamine 300 lb bbls ....lb. | .65 | .67 | .65 | .67 | .65 | .67 |
| Methanol, denat, grd, drs, c-l, frt all'd ....gal. | ... | .46 | .41 | .46 | .30 | .41 |
| tks, frt all'd ....gal. | ... | .40 | .35 | .40 | .25 | .35 |
| Pure, drs, c-l, frt all'd gal. | ... | .38 | ... | .38 | ... | .38 |
| tks ....gal. | ... | .33 | ... | .33 | ... | .33 |
| 95%, tks ....gal. | ... | .31 | ... | .31 | ... | .31 |
| 97%, tks ....gal. | ... | .32 | ... | .32 | ... | .32 |
| Methyl Acetate, tech, tks, delv ....lb. | ... | .06 | .06 | .06½ | ... | .06½ |
| 55 gal drs, delv ....lb. | .07 | .08 | .07 | .08 | .07½ | .08 |
| C.P. 97-99%, tks, delv lb. | | .06¼ | ... | .06¼ | .06¼ | .07 |
| 55 gal drs, delv ....lb. | .07¼ | .07¼ | .07¼ | .07¾ | .07¼ | .08½ |
| Acetone, frt all'd, drs gal. *p* | .41 | .44 | .30 | .44 | .30 | .40½ |
| tks, frt all'd, drs ..gal. *p* | ... | .35 | .25 | .35 | .25 | .32½ |
| Synthetic, frt all'd, east of Rocky M. drs ....gal. *p* | .38 | .41 | .38 | .41 | .38 | .51 |
| tks, frt all'd ..gal. | ... | .31½ | ... | .31½ | .31½ | .39½ |
| West of Rocky M., frt all'd, drs ..gal. *p* | ... | .42 | ... | .42 | .42 | .46 |
| tks, frt all'd...gal. *p* | ... | .35 | ... | .35 | .35 | .39½ |
| Anthraquinone ....lb. | ... | .83 | ... | .83 | ... | .83 |
| Butyl Ketone, tks ....lb. | ... | .10½ | ... | .10½ | ... | .10½ |
| Chloride, 90 lb cyl ....lb. | .32 | .40 | .32 | .40 | .32 | .40 |
| Ethyl Ketone, tks, frt all'd lb. | ... | .05 | ... | .05 | .05 | .06 |
| 50 gal drs, frt all'd c-l lb. | ... | .06 | ... | .06 | .06 | .07 |
| Formate, drs, frt all'd..lb. | .35 | .36 | .35 | .36 | .35 | .36 |
| Hexyl Ketone, pure, drs lb. | ... | .60 | ... | .60 | ... | .60 |
| Lactate, drs, frt all'd ..lb. | ... | .30 | ... | .30 | ... | .30 |
| Mica, dry grd, bgs, wks ..lb. | ... | 30.00 | ... | 30.00 | 30.00 | 35.00 |
| Michler's Ketone, kgs....lb. | ... | 2.50 | ... | 2.50 | ... | 2.50 |
| Monoamylamine, c-l,drs,wks lb. | ... | .52 | ... | .52 | .52 | 1.00 |
| l.c.l. drs, wks ....lb. | ... | .55 | ... | ... | ... | ... |
| tks, wks ....lb. | ... | .50 | ... | ... | ... | ... |
| Monobutylamine, drs, c.l., wks ....lb. | ... | .50 | .50 | .65 | ... | .65 |
| l.c.l., wks ....lb. | ... | .53 | ... | ... | ... | ... |
| tks, wks ....lb. | ... | .48 | ... | ... | ... | ... |
| Monochlorobenzene, see "C" | | | | | | |
| Monoethanolamine, tks, wks lb. | ... | .23 | ... | .23 | ... | .23 |
| Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb. | ... | .65 | ... | .65 | ... | .65 |
| Monomethylparaminosulfate, 100 lb drs ....lb. | 3.75 | 4.00 | 3.75 | 4.00 | 3.75 | 4.00 |
| Morpholine, drs 55 gal, lcl wks ....lb. | | .75 | | | | |
| Myrobalans 25%, liq bbls lb. | ... | ... | .03¾ | .04¼ | .03¾ | .04¼ |
| 50% Solid, 50 lb boxes lb. | ... | ... | .04¼ | .05 | .04⅜ | .06¼ |
| J1 bgs ....ton | 30.00 | nom. | 24.00 | 30.00 | 23.50 | 30.00 |
| J2 bgs ....ton | 21.00 | nom. | 19.00 | 21.00 | 17.00 | 22.00 |
| **N** | | | | | | |
| Naphtha, v.m.&p. (deodorized) see petroleum solvents. | | | | | | |
| Naphtha, Solvent, water-white, tks ....gal. | ... | .26 | ... | .26 | .26 | .31 |
| drs, c-l ....gal. | ... | .31 | ... | .31 | .31 | .36 |
| Naphthalene, dom, crude bgs, wks ....lb. | 2.50 | 2.60 | 2.25 | 2.85 | 2.25 | 2.85 |
| Imported, cif, bgs ...lb. | ... | ... | 1.50 | 1.85 | 1.40 | 2.25 |
| Balls, flakes, pks ....lb. | ... | .06½ | ... | .06½ | .06½ | .08 |
| Balls, ref'd, bbls, wks ..lb. | ... | .05¾ | ... | .05¾ | .05¾ | .07¼ |
| Flakes, ref'd, bbls, wks lb. | ... | .05¾ | ... | .05¾ | .05¾ | .07¼ |
| Nickel Carbonate, bbls ..lb. | .36 | .37½ | .36 | .37½ | .36 | .37½ |
| Chloride, bbls ....lb. | .18 | .20 | .18 | .20 | .18 | .20 |
| Metal ingot ....lb. | ... | .35 | ... | .35 | ... | .35 |
| Oxide, 100 lb kgs, NY lb. | .35 | .37 | .35 | .37 | .35 | .37 |
| Salt, 400 lb bbls, NY .lb. | .13 | .13½ | .13 | .13½ | .13 | .13½ |
| Single, 400 lb bbls, NY lb. | .13 | .13½ | .13 | .13½ | .13 | .13½ |
| Nicotine, 40%, drs, sulfate, 55 lb drs ....lb. | ... | .70 | .70 | .76 | ... | .76 |
| Nitre Cake, blk ....ton | ... | 16.00 | ... | 16.00 | ... | 16.00 |
| Nitrobenzene, redistilled, 1000 lb drs, wks ....lb. | .08 | .10 | .08 | .10 | .08 | .10 |
| tks ....lb. | | .07 | .07 | .07½ | ... | .07½ |
| Nitrocellulose, c-l, l-c-l, wks lb. | .22 | .29 | .22 | .29 | .22 | .29 |
| Nitrogen Sol. 45½% ammon., f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis ..... | ... | 1.2158 | ... | ... | ... | ... |
| Nitrogenous Mat'l, bgs, imp unit | ... | ... | 2.25 | 2.50 | 2.35 | 2.65 |
| dom, Eastern wks ...unit | ... | 3.00 | 2.30 | 3.00 | 2.50 | 2.75 |
| dom, Western wks ...unit | ... | 2.25 | 1.90 | 2.25 | 2.20 | 2.35 |
| Nitronaphthalene, 550 lb bbls lb. | .24 | .25 | .24 | .25 | .24 | .25 |
| Nutgalls Alleppo, bgs ....lb. | ... | .23 | .22 | .23 | .23 | .23 |
| **O** | | | | | | |
| Oak Bark Extract, 25%, bbls lb. | .03⅛ | .03⅜ | .03⅛ | .03½ | ... | .03⅜ |
| tks ....lb. | ... | .02¾ | ... | .02¾ | ... | .02¾ |
| Octyl Acetate, tks, wks ...lb. | ... | .15 | .15 | .17 | .16 | .17 |

*a* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

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**METHYL HEXALIN*** (Methyl Cyclohexanol or Hexahydrocresol) Boiling Range 165°-190° C.

**HEXALIN* ACETATE** (Cyclohexyl Acetate) Boiling Range 160°-180° C.

**CYCLOHEXANONE** Boiling Range 150°-160° C.

**METHYL CYCLOHEXANONE** Boiling Range 160°-175° C.

**SIPALIN* AOM** (Di-Methyl Cyclohexyl Adipate) Boiling Range 230° C at 12 mm.

**CYCLONOL** (Methyl Cyclohexanone Glyceryl Acetal) Boiling Range 130°-140° C. at 20 mm.

*Reg. U. S. Pat. Off

DUPONT

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**Orange-Mineral Phenylhydrazine Hydrochloride**

## Prices

| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Orange-Mineral, 1100 lb cks NY lb. | ... | .10¾ | .10¼ | .10¾ | .09½ .10½ |
| Orthoaminophenol, 50 lb kgs lb. | 2.15 | 2.25 | 2.15 | 2.25 | 2.15 2.25 |
| Orthoanisidine, 100 lb drs lb. | .70 | .74 | .70 | .74 | .70 .74 |
| Orthochlorophenol, drs lb. | ... | .32 | ... | .32 | .32 .75 |
| Orthocresol, 30.4°, drs, wks lb. | .14½ | .15 | .14½ | .17½ | .13½ .17½ |
| Orthodichlorobenzene, 1000 lb drs lb. | .06 | .07 | .06 | .07 | .06 .07 |
| Orthonitrochlorobenzene, 1200 lb drs, wks lb. | .15 | .18 | .15 | .18 | .15 .18 |
| Orthonitroparachlorphenol, tins lb. | ... | .75 | ... | .75 | ... .75 |
| Orthonitrophenol, 350 lb drs lb. | .85 | .90 | .85 | .90 | .85 .90 |
| Orthonitrotoluene, 1000 lb drs. wks lb. | ... | .09 | .08 | .10 | .08 .10 |
| Orthotoluidine, 350 lb bbls, l-c-l lb. | ... | .19 | .16 | .19 | 16 .17 |
| Osage Orange, cryst, bbls lb. | .19 | .25 | .17 | .25 | .17 .25 |
| 51° liquid lb. | | .09 | .07 | .09 | .07 .08 |
| **P** | | | | | |
| Paraffin, rfd, 200 lb bgs 122-127° M P lb. | .04¼ | .04½ | .03¾ | .04½ | .03¾ .04½ |
| 128-132° M P lb. | .04 | .0485 | .04 | .0485 | .04 .049 |
| 133-137° M P lb. | .0515 | .0540 | .0465 | .0540 | .0465 .05¼ |
| Para aldehyde, 99%, tech, 110-55 gal drs, wks lb. | .10 | .11¼ | .10 | .16* | .16* .18* |
| Aminoacetanilid, 100 lb kgs lb. | ... | .85 | ... | .85 | ... .85 |
| Aminohydrochloride, 100 lb kgs lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 1.30 |
| Aminophenol, 100 lb kgs lb. | ... | 1.05 | ... | 1.05 | ... 1.05 |
| Chlorophenol, drs lb. | .30 | .45 | .30 | .45 | .30 .45 |
| Dichlorobenzene, 200 lb drs, wks lb. | .11 | .12 | .11 | .12 | .11 .12 |
| Formaldehyde, drs, wks lb. | .34 | .35 | .34 | .35 | .34 .35 |
| Nitroacetanilid, 300 lb bbls lb. | .45 | .52 | .45 | .52 | .45 .52 |
| Nitroaniline, 300 lb bbls, wks lb. | .45 | .47 | .45 | .47 | .45 .47 |
| Nitrochlorobenzene, 1200 lb drs, wks lb. | .15 | .16 | .15 | .16 | .15 .16 |
| Nitro-orthotoluidine, 300 lb bbls lb. | 2.75 | 2.85 | 2.75 | 2.85 | 2.75 2.85 |
| Nitrophenol, 185 lb bbls lb. | .35 | .37 | .35 | .37 | .35 .37 |
| Nitrosodimethylaniline, 120 lb bbls lb. | .92 | .94 | .92 | .94 | .92 .94 |
| Nitrotoluene, 350 lb bbls lb. | ... | .30 | .30 | .35 | ... .35 |
| Phenylenediamine, 350 lb bbls lb. | 1.25 | 1.30 | 1.25 | 1.30 | 1.25 1.30 |
| Toluenesulfonamide, 175 lb bbls. lb. | .70 | .75 | .70 | .75 | .70 .75 |
| tks, wks lb. | ... | .31 | ... | .31 | ... .31 |
| Toluenesulfonchloride, 410 lb bbls, wks lb. | .20 | .22 | .20 | .22 | .20 .22 |
| Toluidine, 350 lb bbls, wks lb. | .48 | .50 | .48 | .58 | .56 .58 |
| Paris Green, dealers, drs lb. | .23 | .26 | .23 | .26 | .23 .26½ |
| Pentane, normal, 28-38° C, group 3, tks gal. | ... | .08½ | ... | .08½ | ... .08½ |
| drs, group 3 gal. | .11½ | .16 | .11½ | .16 | .11½ .16 |
| Perchlorethylene, 100 lb drs, frt all'd lb. | .08 | .08¾ | .08 | .10½ | ... .10½ |
| Petrolatum, dark amber, bbls lb. | .03 | .04⅛ | .02⅝ | .04⅛ | .02⅝ .03⅞ |
| Light, bbls lb. | .03¼ | .04⅜ | .03⅛ | .04⅜ | .03⅛ .03⅜ |
| Medium, bbls lb. | .02⅞ | .03⅛ | .02⅞ | .03⅛ | .02⅞ .03⅛ |
| Dark green, bbls lb. | .02½ | .02¾ | .02½ | .02¾ | .02½ .02¾ |
| Red, bbls lb. | .02½ | .03⅝ | .02½ | .03⅜ | .02½ .03⅝ |
| White, lily, bbls lb. | .06 | .07½ | .05¼ | .07½ | .05¼ .07⅛ |
| White, snow, bbls lb. | .07 | .08½ | .06¼ | .08½ | .06¼ .08½ |
| Petroleum Ether, 30-60°, group 3, tks gal. | ... | .13½ | .13 | .13½ | ... .13 |
| drs, group 3 gal. | .14½ | .25½ | .14 | .25½ | .14 .17 |
| **PETROLEUM SOLVENTS AND DILUENTS** | | | | | |
| Cleaners naphthas, group 3. tks, wks gal. | .06⅞ | .07 | .06⅜ | .07 | .06⅜ .07⅜ |
| East Coast, tks, wks gal. | ... | .10 | ... | .10 | ... .10 |
| Hydrogenated, naphthas, frt all'd East, tks gal. | ... | .16 | ... | .16 | ... .16 |
| No. 2, tks gal. | ... | .18 | ... | .18 | ... .18 |
| No. 3, tks gal. | ... | .16 | ... | .16 | ... .16 |
| No. 4, tks gal. | ... | .18 | ... | .18 | ... .18 |
| Lacquer diluents, tks, East Coast gal. | | .09 | .09 | .12½ | .12 .12½ |
| Group 3, tks gal. | .07⅞ | .08 | .07⅜ | .08 | .07⅜ .08⅜ |
| Naphtha, V.M.P., East, tks wks gal. | | .09 | .09 | .10 | .09½ .10 |
| Group 3, tks, wks gal. | .06⅞ | .07 | .06⅜ | .07 | .06⅜ .07⅜ |
| Petroleum thinner, 43-47, East, tks, wks gal. | | .08½ | .08½ | .10 | .08½ .10 |
| Group 3, tks, wks gal. | .05⅞ | .06 | .05⅜ | .06 | .05⅜ .06⅜ |
| Rubber Solvents, stand grd. East, tks, wks gal. | | .09 | .09 | .10 | .09½ .10 |
| Group 3 tks, wks gal. | .06⅞ | .07 | .06⅜ | .07 | .06⅜ .07⅜ |
| Stoddard Solvent, East, tks, wks gal. | | .08½ | .08½ | .10 | .09½ .10 |
| Group 3, tks, wks gal. | .06⅜ | .06½ | .05⅞ | .06½ | .05⅞ .06⅞ |
| Phenol, 250-100 lb drs lb. | .13 | .14¾ | .13 | .15½ | .14½ .15½ |
| tks, wks lb. | ... | .12 | .12 | .13½ | ... .13½ |
| Phenyl-Alpha-Naphthylamine, 100 lb kgs lb. | ... | 1.35 | ... | 1.35 | ... 1.35 |
| Phenyl Chloride, drs lb. | ... | .17 | ... | .17 | ... .17 |
| Phenylhydrazine Hydrochloride, com lb. | ... | 1.50 | ... | 1.50 | ... 1.50 |

* These prices were on a delivered basis.

## Current



| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Phloroglucinol, tech, tins lb. | 15.00 | 15.00 | 16.50 | 15.00 | 16.50 |
| 70% basis ton | 20.00 | 20.00 | 22.00 | 20.00 | 22.00 |
| 72% basis ton | | | | | |
| 75-74% basis ton | ... | ... | 1.85 | ... | 1.85 |
| 75% basis ton | ... | ... | 2.35 | ... | 2.35 |
| Tennessee, 72% basis ton | ... | ... | 2.85 | ... | 2.85 |
| Phosphorus Oxychloride 175 lb cyl lb. | ... | ... | 3.85 | ... | 3.85 |
| Red, 110 lb cases lb. | ... | ... | 5.50 | ... | 5.50 |
| Sesquisulfide, 100 lb cs. lb. | ... | ... | 4.50 | ... | 4.50 |
| Trichloride, cyl lb. | .16 | .16 | .20 | .16 | .20 |
| Yellow, 110 lb cs, wks lb. | .40 | .40 | .44 | .40 | .44 |
| Phthalic Anhydride, 100 lb | .38 | .38 | .44 | .38 | .44 |
| drs, wks lb. | .15 | .15 | .18 | .15 | .18 |
| Pine Oil, 55 gal drs or bbls | .24 | .24 | .30 | .24 | .30 |
| Destructive dist lb. | | | | | |
| Steam dist wat wh bbls gal. | .. | ... | .14½ | ... | .14½ |
| tks gal. | | | | | |
| Pitch Hardwood, wks ton | 46 | .46 | .48 | .46 | .55 |
| Coaltar, bbls, wks ton | .. | ... | .59 | ... | .59 |
| Burgundy, dom, bbls, wks lb. | ... | ... | .54 | ... | .54 |
| Imported lb. | 18.25 | 18.25 | 18.75 | 18.25 | 18.75 |
| Petroleum, see Asphaltum | | ... | 19.00 | ... | 19.00 |
| in Gums' Section. | .05½ | .05½ | .06½ | .05½ | .06½ |
| Pine, bbls bbl. | .15 | .15 | .16 | .15 | .16 |
| Stearin, drs lb. | | | | | |
| Platinum, ref'd oz. | | | | | |
| CP, tins lb. | 6.00 | 6.00 | 6.25 | 5.75 | 6.25 |
| Phosphate Rock, f.o.b. mines | .03 | .03 | .04½ | .03 | .04½ |
| Florida Pebble, 68% basis ton | 40.00 | 32.00 | 42.00 | 30.00 | 39.00 |
| **POTASH** | | | | | |
| Potash, Caustic, wks, sol. lb. | .06¼ | .06¼ | .06½ | .06¼ | .06½ |
| flake lb. | .07 | .07 | .07⅛ | .07 | .07⅛ |
| Liquid, tks lb. | ... | ... | .02⅞ | ... | .02⅞ |
| Manure Salts, imported 30% basis, blk unit | ... | ... | .58½ | ... | .58½ |
| Potassium Abietate, bbls. lb. | ... | ... | .09 | .08 | .13 |
| Acetate, tech, bbls, delv lb. | ... | ... | .26 | .26 | .28 |
| Bicarbonate, USP, 320 lb bbls lb. | ... | ... | .18 | ... | .18 |
| Bichromate Crystals, 725 lb cks* lb. | .08¾ | .08¾ | .09¼ | .08¾ | .09¼ |
| Binoxalate, 300 lb bbls. lb. | ... | ... | .23 | ... | .23 |
| Bisulfate, 100 lb kgs. lb. | .15½ | .15½ | .18 | .15½ | .18 |
| Carbonate, 80-85% calc 800 lb cks lb. | .06½ | .06½ | .07 | .06½ | .07 |
| liquid, tks lb. | ... | ... | .02⅞ | ... | .02⅞ |
| drs, wks lb. | .03 | .03 | .03½ | .03 | .03½ |
| Chlorate crys, 112 lb kgs, wks lb. | .09¼ | .09¼ | .09½ | .09¼ | .09½ |
| gran, kgs lb. | .12 | .12 | .13 | .12 | .13 |
| powd, kgs lb. | .08½ | .08½ | .08¾ | .08½ | .08¾ |
| Chloride, crys, bbls lb. | .04 | .04 | .04¼ | .04 | .04¼ |
| Chromate, kgs lb. | .19 | .19 | .28 | .19 | .28 |
| Cyanide, 110 lb cases. lb. | .50 | .50 | .55 | .50 | .57½ |
| Iodide, 250 lb bbls lb. | ... | 1.13 | ... | 1.13 | .93 1.13 |
| Metabisulfite, 300 lb bbls lb. | .16 | .11 | .16 | .12 | .15 |
| Muriate, bgs, dom, blk unit | ... | ... | .53½ | ... | .53½ |
| Oxalate, bbls lb. | .25 | .25 | .26 | .25 | .26 |
| Perchlorate, kgs, wks. lb. | .09 | .09 | .10½ | .09 | .11½ |
| Permanganate, USP, crys, 500 & 1000 lb drs, wks lb. | .18½ | .18½ | .19½ | .18½ | .19½ |
| Prussiate, red, bbls lb. | ... | .30½ | .34 | .30½ | .37 |
| Yellow, bbls lb. | .15 | .14 | .16 | .15 | .16 |
| Sulfate, 90% basis, bgs ton | ... | 36.25 | 36.25 | 38.00 | ... 38.00 |
| Titanium Oxalate, 200 lb bbls lb. | .35 | .35 | .40 | .35 | .40 |
| Pot & Mag Sulfate, 48% basis bgs ton | ... | 24.75 | 24.75 | 25.75 | ... 25.75 |
| Propane, group 3, tks lb. | .03 | .03 | .04⅛ | .03 | .04⅛ |
| Putty, coml, tubs 100 lb. | ... | 6.00 | 3.00 | 6.00 | 2.25 3.00 |
| Linseed Oil, kgs 100 lb. | ... | 4.50 | | 4.50 | 4.00 4.65 |
| Pyrethrum, conc liq: 2.4% pyrethrins, drs, frt all'd gal. | 7.15 | 7.50 | 5.75 | 7.50 | 5.00 6.75 |
| 3.6% pyrethrins, drs, frt all'd gal. | 10.65 | 11.00 | 8.45 | 11.00 | 7.65 9.95 |
| Flowers, coarse, Japan, bgs lb. | .33 | .36 | .26 | .36 | .18 .28½ |
| Fine powd, bbls lb. | .35 | .37 | .27 | .37 | .19 .30 |
| Pyridine, denat, 50 gal drs gal. | ... | 1.63 | ... | 1.63 | 1.53 1.63 |
| Refined, drs lb. | ... | .50 | ... | .50 | .45 .50 |
| Pyrites, Spanish cif Atlantic ports, blk unit | .12 | .12 | .13 | .12 | .13 |
| Pyrocatechin, CP, drs, tins lb. | 2.15 | 2.15 | 2.75 | 2.15 | 2.75 |
| **Q** | | | | | |
| Quebracho, 35% liq tks lb. | ... | ... | .02⅞ | .03⅜ | .03 .03⅜ |
| 450 lb bbls, c-l lb. | ... | ... | .04 | .04⅛ | .03½ .04⅛ |
| Solid, 63%, 100 lb bales cif lb. | ... | ... | ... | .04 | ... .04 |
| Clarified, 64%, bales. lb. | ... | ... | ... | .04¼ | ... .04¼ |
| Quercitron, 51 deg liq, 450 lb bbls lb | .07½ | .08½ | .07½ | .08½ | .06 .08½ |
| Solid, drs lb. | .10 | .12 | .10 | .12 | .10 .12 |
| **R** | | | | | |
| R Salt, 250 lb bbls, wks lb. | .52 | .55 | .52 | .55 | .52 .55 |
| Resorcinol tech, cans lb. | .75 | .80 | .75 | .80 | .75 .80 |
| Rochelle Salt, cryst lb. | .20¾ | .21¼ | .17¾ | .21¼ | .15 .18¼ |
| Powd, bbls lb. | .19¾ | .20¼ | .16¾ | .20¼ | .16 .18½ |
| Rosin Oil, bbls, first run gal. | .45 | .47 | .45 | .47 | .45 .60 |
| Second run gal. | .47 | .49 | .47 | .49 | .47 .62 |
| Third run, drs gal. | .51 | .53 | .51 | .53 | .51 .66 |

* Spot price is ½c higher.

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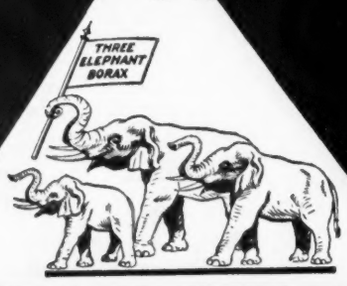


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70 PINE STREET NEW YORK

## Rosins
## Sodium Nitrate

# Prices

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Rosins 600 lb bbls, 280 lb unit ex. yard NY:*** | | | | | | |
| B | ... | 5.30 | 4.60 | 5.40 | 4.65 | 6.00 |
| D | ... | 5.50 | 4.95 | 5.70 | 4.75 | 6.00 |
| E | ... | 6.40 | 5.20 | 6.40 | 4.90 | 6.00 |
| F | ... | 6.75 | 5.50 | 6.75 | 5.05 | 7.00 |
| G | 6.70 | 6.75 | 5.75 | 7.00 | 5.25 | 7.05 |
| H | 6.80 | 6.95 | 5.75 | 7.10 | 5.25 | 7.15 |
| I | 6.95 | 7.02½ | 5.77½ | 7.12½ | 5.25 | 7.15 |
| K | 7.00 | 7.05 | 5.80 | 7.15 | 5.25 | 7.25 |
| M | 7.05 | 7.10 | 5.90 | 7.25 | 5.25 | 7.40 |
| N | ... | 7.15 | 6.75 | 7.40 | 6.20 | 7.50 |
| WG | ... | 7.30 | 7.10 | 7.70 | 6.75 | 8.45 |
| WW | ... | 7.65 | 7.45 | 8.50 | 7.55 | 9.15 |
| Rosins, Gum, Savannah (280 lb unit):** | | | | | | |
| B | ... | 3.90 | 3.25 | 4.00 | 3.25 | 4.60 |
| D | ... | 4.10 | 3.55 | 4.30 | 3.50 | 4.60 |
| E | ... | 5.00 | 3.80 | 5.00 | 3.55 | 4.60 |
| F | ... | 5.35 | 4.00 | 5.35 | 3.90 | 5.60 |
| G | ... | 5.40 | 4.40 | 5.60 | 4.10 | 5.65 |
| H | ... | 5.40 | 4.40 | 5.70 | 4.20 | 5.75 |
| I | ... | 5.55 | 4.40 | 5.72½ | 4.20 | 5.85 |
| K | ... | 5.60 | 4.40 | 5.75 | 4.20 | 6.00 |
| M | ... | 5.65 | 4.40 | 5.85 | 4.20 | 6.15 |
| N | ... | 5.70 | 5.10 | 6.00 | 4.80 | 6.20 |
| WG | ... | 5.90 | 5.60 | 6.30 | 5.40 | 7.05 |
| WW | ... | 6.25 | 5.60 | 7.10 | 6.10 | 7.75 |
| X | ... | 6.25 | 6.05 | 7.10 | 6.10 | 7.75 |
| Rosin, Wood, c-l, FF grade, NY | 4.00 | 6.80 | 5.35 | 6.80 | 5.05 | 6.40 |
| Rotten Stone, bgs mines..ton | 25.50 | 37.50 | 22.50 | 37.50 | 22.50 | 35.00 |
| Imported, lump, bbls ..lb. | ... | .14 | ... | .14 | .12 | .14 |
| Powdered, bbls .....lb. | .08½ | .10 | .08½ | .10 | .08½ | .10 |
| S | | | | | | |
| Sago Flour, 150 lb bgs...lb. | .04 | .04½ | .02½ | .04½ | .02½ | .03¾ |
| Sal Soda, bbls, wks ...100 lb. | ... | 1.20 | ... | 1.20 | | 1.20 |
| Salt Cake, 94-96%, c-l, wks ton | 19.00 | 25.00 | 19.00 | 25.00 | 19.00 | 23.00 |
| Chrome, c-l, wks .....ton | 11.00 | 12.00 | 11.00 | 12.00 | 11.00 | 12.00 |
| Saltpetre, gran, 450-500 lb bbls .....lb. | .06½ | .069 | .06½ | .069 | .06½ | .069 |
| Cryst, bbls .....lb. | .07½ | .0865 | .07½ | .0865 | .07½ | .0865 |
| Powd, bbls .....lb. | .07½ | .079 | .07½ | .079 | .07½ | .079 |
| Satin, White, pulp, 550 lb bbls .....lb. | .01¼ | .01½ | .01¼ | .01½ | .01¼ | .01½ |
| Schaeffer's Salt, kgs .....lb. | .46 | .48 | .46 | .48 | .46 | .48 |
| Shellac, Bone dry, bbls..lb. *r* | .24 | nom. | .18 | .24 | .16½ | .20 |
| Garnet, bgs .....lb. | .16 | nom. | .12½ | .16 | .12½ | .15 |
| Superfine, bgs .....lb. *s* | .17 | nom. | .10 | .17 | .11 | .13½ |
| T. N., bgs .....lb. *s* | .16 | nom. | .09½ | .16 | .10½ | .12½ |
| Silver Nitrate, vials .....oz. | .27½ | .29½ | .26⅞ | .33½ | .33½ | .34⅞ |
| Slate Flour, bgs, wks. ton | 9.00 | 10.00 | 9.00 | 10.00 | 9.00 | 10.00 |
| Soda Ash, 58% dense, bgs, c-l, wks .....100 lb. | ... | 1.10 | .. | 1.10 | ... | 1.10 |
| 58% light, bgs .....100 lb. | ... | 1.08 | ... | 1.08 | ... | 1.08 |
| blk .....100 lb. | ... | .90 | ... | .90 | ... | .90 |
| paper bgs .....100 lb. | ... | 1.05 | ... | 1.05 | ... | 1.05 |
| bbls .....100 lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| Caustic, 76% grnd & flake, drs .....100 lb. | ... | 2.70 | ... | 2.70 | ... | 2.70 |
| 76% solid, drs ....100 lb. | ... | 2.30 | ... | 2.30 | ... | 2.30 |
| Liquid sellers, tks ..100 lb. | ... | 1.97½ | ... | 1.97½ | ... | 1.97½ |
| Sodium Abietate, drs ....lb. | ... | .11 | ... | .11 | .10 | .13 |
| Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks .....lb. | .04 | .05 | .04 | .05 | .04 | .05 |
| anhyd, drs, delv .....lb. | ... | .08¼ | ... | .08¼ | ... | .08¼ |
| Alginate, drs .....lb. | .71 | .95 | .70 | .95 | .69 | .70 |
| Antimoniate, bbls .....lb. | .16 | nom. | .11½ | .16 | .12 | .15¼ |
| Arsenate, drs .....lb. | .08 | .08½ | .08 | .08½ | .08 | .08½ |
| Arsenite, liq, drs ....gal. | ... | .35 | .30 | .35 | .30 | .33 |
| Dry, gray, drs, wks. lb. | .07½ | .09½ | .07½ | .09½ | .07½ | .09½ |
| Benzoate, USP kgs ...lb. | .46 | .48 | .46 | .48 | .46 | .48 |
| Bicarb, powd, 400 lb bbl, wks .....100 lb. | ... | 1.85 | ... | 1.85 | ... | 1.85 |
| Bichromate, 500 lb cks, wks* .....lb. | .06¾ | .07¼ | .06¾ | .07¼ | .06¾ | .07¼ |
| Bisulfite, 500 lb bbls, wks lb. | .033 | .036 | .03¼ | .036 | .03 | .036 |
| 35-40% sol bbls, wks 100 lb. | 1.40 | 1.80 | 1.40 | 1.80 | 1.40 | 1.80 |
| Chlorate, bgs, wks .... lb. | .06¼ | .07½ | .06¼ | .07½ | .06¼ | .07½ |
| Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb. | .14 | .15 | .14 | .15 | .14 | .17½ |
| Diacetate, 33-35% acid, bbls, lcl, delv .....lb. | ... | .09 | ... | .09 | ... | .09 |
| Fluoride, white 90%, 300 lb. bbls, wks .....lb. | .07¼ | .08¾ | .07¼ | .08¾ | .07½ | .08¼ |
| Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb. | .16 | .17 | .16 | .17 | .16 | .17 |
| Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb. | ... | 2.80 | ... | 2.80 | 2.50 | 2.80 |
| Tech, reg cryst, 375 lb bbls, wks .....100 lb. | 2.45 | 2.80 | 2.45 | 2.80 | 2.40 | 2.80 |
| Iodide, jars .....lb. | ... | 2.10 | ... | 2.10 | 1.90 | 2.10 |
| Metal, drs, 280 lbs ....lb. | ... | .19 | ... | .19 | ... | .19 |
| Metanilate, 150 lb bbls..lb. | .41 | .42 | .41 | .42 | .41 | .42 |
| Metasilicate, gran, c-l, wks .....100 lb. | ... | 2.20 | ... | 2.20 | 2.15 | 2.20 |
| cryst, drs, c-l, wks 100 lb. | ... | 2.90 | ... | 2.90 | 2.75 | 2.90 |
| Monohydrated, bbls ....lb. | | .023 | ... | .023 | ... | .023 |
| Naphthenate, drs .....lb | .12 | .19 | .12 | .19 | .12 | .19 |
| Naphthionate, 300 lb bbl lb | ... | .50 | .50 | .54 | .52 | .54 |
| Nitrate, 92%, crude, 200 lb bgs, c-l, NY .....ton | ... | 28.30 | ... | 28.30 | ... | 28.30 |
| 100 lb bgs .....ton | ... | 29.00 | ... | 29.00 | ... | 29.00 |
| Bulk .....ton | ... | 27.00 | ... | 27.00 | ... | 27.00 |

*r* Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case: *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ⅛c higher. ** Aug. 31. *** Aug. 31.

| | | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Sodium (continued): | | | | | | |
| Nitrite, 500 lb bbls | lb. | .06¾ | .11½ | .06¾ | .11½ | .06¾ .11½ |
| Orthochlorotoluene, sulfonate, 175 lb bbls, wks | lb. | .25 | .27 | .25 | .27 | .25 .27 |
| Orthosilicate, 300 lb drs, c.l. | lb. | ... | 2.90 | 2.90 | 2.90 | 2.90 2.90 |
| Perborate, drs, 400 lbs | lb. | .14¾ | .15¼ | .14¾ | .15¼ | .14¾ .15¼ |
| Peroxide, bbls, 400 lb | lb. | ... | .17 | ... | .17 | ... .17 |
| Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb. | | ... | 2.05 | ... | 2.05 | ... 2.05 |
| bgs, wks 100 lb. | | ... | 1.85 | ... | 1.85 | ... 1.85 |
| Tri-sodium, tech, 325 lb bbls, wks 100 lb. | | ... | 2.20 | ... | 2.20 | ... 2.20 |
| bgs, wks 100 lb. | | ... | 2.00 | ... | 2.00 | ... 2.00 |
| Picramate, 160 lb kgs | lb. | .65 | .67 | .65 | .67 | .65 .67 |
| Prussiate, Yellow, 350 lb bbl, wks | lb. | .10½ | .10¾ | .09½ | .10¾ | .09 .11½ |
| Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq | lb. | ... | .0530 | ... | .0530 | .0530 .10 |
| Sesquisilicate, drs, c-l, wks 100 lb. | | ... | 2.80 | ... | 2.80 | 2.80 3.00 |
| Silicate, 60°, 55 gal drs, wks 100 lb. | | 1.65 | 1.70 | 1.65 | 1.70 | 1.65 1.70 |
| 40°,55 gal drs, wks 100 lb. | | ... | .80 | ... | .80 | ... .80 |
| tks, wks 100 lb. | | ... | .65 | ... | .65 | ... .65 |
| Silicofluoride, 450 lb bbls NY | lb. | .04¼ nom. | | .03½ | .04¾ | .04¾ .06½ |
| Stannate, 100 lb drs | lb. | ... | ... | .30 | .35 | .25½ .34 |
| Stearate, bbls | lb. | .19 | .24 | .19 | .24 | .19 .24 |
| Sulfanilate, 400 lb bbls | lb. | .16 | .18 | .16 | .18 | .16 .18 |
| Sulfate Anhyd, 550 lb bgs* c-l, wks 100 lb. | ‡ | 1.45 | 1.90 | 1.45 | 1.90 | 1.45 1.90 |
| Sulfide, 80% cryst, 440 lb bbls, wks | lb. | ... | .02½ | .02¼ | .02½ | ... .02¼ |
| Solid, 650 lb drs, c-l, wks | lb. | ... | .03¼ | .03 | .03½ | ... .03 |
| Sulfite, cryst, 400 lb bbls, wks | lb. | .023 | .02½ | .023 | .02½ | .023 .02½ |
| Sulfocyanide, drs | lb. | .28 | .47 | .28 | .47 | .28 .47 |
| Sulforicinoleate, bbls | lb. | | .12 | ... | .12 | ... .12 |
| Tungstate, tech, crys, kgs | lb. | 1.05 | 1.10 | 1.05 | 1.10 | 1.05 1.35 |
| Sorbitol, com, solut, wks c-l, drs, wks | lb. | ... | .15½ | ... | .15½ | .15½ .19 |
| Spruce Extract, ord, tks | lb. | ... | .01⅛ | ... | .01⅛ | ... .01⅛ |
| Ordinary, bbls | lb. | ... | .01⅛ | ... | .01⅛ | ... .01⅛ |
| Super spruce ext, tks | lb. | ... | .01⅜ | ... | .01⅜ | ... .01⅜ |
| Super spruce ext, bbls | lb. | ... | .01⅞ | ... | .01⅞ | ... .01⅞ |
| Super spruce ext, powd, bgs | lb. | ... | .04 | ... | .04 | ... .04 |
| Starch, Pearl, 140 lb bgs | 100 lb. | ... | 2.65 | 2.40 | 2.85 | 2.40 3.18 |
| Powd, 140 lb bgs | 100 lb. | ... | 2.75 | 2.50 | 2.90 | 2.50 3.28 |
| Potato, 200 lb bgs | lb. | .06 | nom. | .04 | .06 | .03½ .05½ |
| Imp, bgs | lb. | .06 | nom. | .05 | .06 | .05 .06 |
| Rice, 200 lb bbls | lb. | .07¼ | nom. | .06¼ | .07¼ | .06¼ .07¼ |
| Sweet Potato, 240 lb bbls, f.o.b. plant | 100 lb. | 7.25 | 7.50 | 7.25 | 7.50 | |
| Wheat, thick, bgs | lb. | .05¼ | nom. | .05 | .05½ | .06¼ .07 |
| Strontium carbonate, 600 lb bbls, wks | lb. | .21 | nom. | .16 | .21 | .16½ .17 |
| Nitrate, 600 lb bbls, NY | lb. | .07¾ | .08¼ | .07¾ | .08¼ | .07¾ 09¼ |
| Sucrose octa-acetate, den, grd, bbls, wks | lb. | ... | .45 | ... | .45 | ... .45 |
| tech, bbls, wks | lb. | ... | .40 | ... | .40 | ... .40 |
| Sulfur, crude, f.o.b. mines | ton | ... | 16.00 | ... | 16.00 | 16.00 19.00 |
| Flour, coml, bgs | 100 lb. | 1.65 | 2.35 | 1.65 | 2.35 | 1.65 2.35 |
| bbls | 100 lb. | 1.95 | 2.70 | 1.95 | 2.70 | 1.95 2.70 |
| Rubbermakers, bgs | 100 lb. | 2.20 | 2.80 | 2.20 | 2.80 | 2.20 2.80 |
| bbls | 100 lb. | 2.55 | 3.15 | 2.55 | 3.15 | 2.55 3.15 |
| Extra fine, bgs | 100 lb. | 2.85 | 3.00 | 2.85 | 3.00 | 2.85 3.00 |
| Superfine, bgs | 100 lb. | 2.65 | 2.80 | 2.65 | 2.80 | 2.65 2.80 |
| bbls | 100 lb. | 2.25 | 3.10 | 2.25 | 3.10 | 2.25 3.10 |
| Flowers, bgs | 100 lb. | 3.00 | 3.75 | 3.00 | 3.75 | 3.00 3.75 |
| bbls | 100 lb. | 3.35 | 4.10 | 3.35 | 4.10 | 3.35 4.10 |
| Roll, bgs | 100 lb. | 2.35 | 3.10 | 2.35 | 3.10 | 2.35 3.10 |
| bbls | 100 lb. | 2.50 | 3.25 | 2.50 | 3.25 | 2.50 3.25 |
| Sulfur Chloride, 700 lb drs, wks | lb. | .03 | .04 | .03 | .04 | .03 .04 |
| Sulfur Dioxide, 150 lb cyl | lb. | .07 | .09 | .07 | .09 | .07 .09 |
| Multiple units, wks | lb. | .04½ | .07 | .04½ | .07 | .04½ .07 |
| tks, wks | lb. | .04 | .05 | .04 | .05 | .04 .05 |
| Refrigeration, cyl, wks | lb. | .16 | .17 | .16 | .17 | .16 .17 |
| Multiple units, wks | lb. | .07½ | .10 | .07½ | .10 | .07½ .10 |
| Sulfuryl Chloride | lb. | .15 | .40 | .15 | .40 | .15 .40 |
| Sumac, Italian, grd | ton | 78.00 | nom. | 65.50 | 78.00 | 62.00 68.00 |
| Extract, 42°, bbls | lb. | ... | ... | .05¼ | .06¼ | .05¼ .06¼ |
| Superphosphate, 16% bulk, wks | ton | ... | 8.00 | ... | 8.00 | 8.00 9.00 |
| Run of pile | ton | ... | 7.50 | ... | 7.50 | 7.50 8.50 |
| Triple, 40-48%, a.p.a. bulk, wks, Balt. unit | ton | ... | .70 | ... | .70 | .70 85 |
| Talc, Crude, 100 lb bgs, NY | ton | 13.00 | 15.00 | 13.00 | 15.00 | 13.00 15.00 |
| Ref'd, 100 lb bgs, NY | ton | 14.00 | 16.00 | 14.00 | 16.00 | 14.00 16.00 |
| French, 220 lb bgs, NY | ton | 23.00 | 30.00 | 23.00 | 30.00 | 23.00 30.00 |
| Ref'd, white, bgs, NY | ton | 45.00 | 60.00 | 45.00 | 60.00 | 45.00 60.00 |
| Italian, 220 lb bgs to arr | ton | 60.00 | 62.00 | 60.00 | 62.00 | 60.00 62.00 |
| Ref'd, white, bgs, NY | ton | 65.00 | 70.00 | 65.00 | 70.00 | 65.00 70.00 |
| Tankage Grd, NY | unit | ... | 3.25 | 2.75 | 3.25 | 2.50 3.15 |
| Ungrd | unit | ... | 5.00 | 2.75 | 5.00 | 2.35 3.00 |
| Fert grade, f.o.b. Chgo | unit | ... | 4.50 | 2.50 | 4.50 | 2.25 3.00 |
| South American cif | unit | ... | 3.80 | 3.00 | 3.80 | 3.00 3.45 |
| Tapioca Flour, high grade, bgs | lb. | .04½ | nom. | .01¾ | .05½ | .02 .05½ |
| Tar Acid Oil, 15%, drs | gal. | .21 | .23 | .21 | .24 | .21 .25½ |
| 25%, drs | gal. | .25 | .27 | .25 | .28 | .25 .29½ |
| Tar, pine, delv, drs | gal. | .25 | .26 | .25 | .26 | ... .26 |
| tks, delv, E. cities | gal. | | .20 | | .20 | .20 |
| Tartar Emetic, tech, bbls | lb. | .29¼ | .30 | .27¾ | .30 | .26¾ .28 |
| USP, bbls | lb. | ... | .35 | .33 | .35 | .32 .33½ |

‡ Bags 15c lower; u + 10; * Bbls. are 20c higher.


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## Prices

| | Current Market | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|
| Terpineol, den grade, drs lb. | ... | .17 | ... | .17 | ... | .17 |
| Tetrachlorethane, 650 lb drs lb. | .08 | .08½ | .08 | .08½ | .08 | .08½ |
| Tetrachloroethylene, drs, tech lb. | ... | .09½ | ... | .09½ | ... | .09½ |
| Tetralene, 50 gal drs, wks lb. | .12 | .13 | .12 | .13 | .12 | .13 |
| Thiocarbanilid, 170 lb bbls lb. | .20 | .25 | .20 | .25 | .20 | .25 |
| Tin, crystals, 500 lb bbls, wks lb. | ... | ... | .35½ | .39 | .31 | .36½ |
| Metal, NY lb. | ... | .60 | .4520 | .60 | .3570 | .4675 |
| Oxide, 300 lb bbls, wks lb. | ... | ... | .50 | .54 | .44 | .50 |
| Tetrachloride, 100 lb drs, wks lb. | ... | .30 | .23 | .32 | .18½ | .23½ |
| Titanium Dioxide, 300 lb bbls lb. | .13¼ | .16 | .13¼ | .16 | .14½ | .17 |
| Barium Pigment, bbls lb. | .05½ | .06½ | .05⅝ | .06½ | .05⅝ | .06⅜ |
| Calcium Pigment, bbls lb. | .05½ | .06½ | .05⅝ | .06½ | .05⅝ | .06⅜ |
| Toluidine, mixed, 900 lb drs, wks lb. | .26 | .27 | .26 | .27 | .26 | .27 |
| Toluol, 110 gal drs, wks gal. | ... | .27 | ... | .27 | .27 | .35 |
| 8000 gal tks, frt all'd gal. | ... | .22 | ... | .22 | .22 | .30 |
| Toner Lithol, red, bbls lb. | .62 | .67 | .62 | .80 | .75 | .80 |
| Para, red, bbls lb. | .75 | .80 | .75 | .80 | .75 | .80 |
| Toluidine, bgs lb. | ... | 1.35 | ... | 1.35 | ... | 1.35 |
| Triacetin, 50 gal drs, wks lb. | ... | .36 | ... | .36 | ... | .36 |
| Triamyl Borate, lcl, drs, wks lb. | ... | .27 | ... | .27 | ... | .27 |
| Triamylamine, c-l, drs, wks lb. | ... | .77 | .77 | 1.25 | .77 | 1.25 |
| lcl, wks, drs, lb. | ... | .80 | ... | ... | ... | ... |
| tks, wks, lb. | ... | .75 | ... | ... | ... | ... |
| Tributylamine, lcl, drs, wks lb. | ... | .70 | ... | .70 | ... | .70 |
| cl, drs, wks lb. | ... | .67 | ... | ... | ... | ... |
| tks, wks lb. | ... | .65 | ... | ... | ... | ... |
| Tributyl citrate, drs, frt all'd lb. | ... | .45 | ... | .45 | ... | .45 |
| Tributyl Phosphate, frt all'd lb. | ... | .42 | ... | .42 | .42 | .50 |
| Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts. lb. | .08 | .08¼ | .08 | .09½ | .089 | .09½ |
| Tricresyl phosphate, tech, drs lb. | .23 | .37½ | .23 | .37½ | .23 | .39 |
| Triethanolamine, 50 gal drs wks lb. | .21 | .22 | .21 | .22 | .21 | .22 |
| tks, wks lb. | ... | .20 | ... | .20 | ... | .20 |
| Triethylene glycol, drs, wks lb. | ... | .26 | ... | .26 | ... | .26 |
| Tribydroxyethylamine Oleate, bbls lb. | ... | .30 | ... | .30 | ... | .30 |
| Stearate, bbls lb. | ... | .30 | ... | .30 | ... | .30 |
| Trimethyl Phosphate, drs, lcl f.o.b. dest lb. | ... | .50 | ... | .50 | ... | .50 |
| Trimethylamine, c-l, drs, frt all'd E. Mississippi lb. | ... | 1.00 | ... | 1.00 | ... | 1.00 |
| Triphenylguanidine lb. | .58 | .60 | .58 | .60 | .58 | .60 |
| Triphenyl Phosphate, drs lb. | ... | .38 | ... | .38 | .34 | .38 |
| Tripoli, airfloated, bgs, wks ton | 26.00 | 30.00 | 26.00 | 30.00 | 26.00 | 30.00 |
| Turpentine (Spirits), c-l, NY dock, bbls gal. | ... | .33** | .29 | .35* | .26½ | .31½ |
| Savannah, bbls gal. | ... | .27½* | .23½ | .29* | .20½ | .30¾ |
| Jacksonville, bbls gal. | ... | .27¾* | .23½ | .26¾ | .20½ | .30¾ |
| Wood Steam dist, drs, c-l, NY gal. | .29 | .32 | .242 | .32 | .242 | .31 |
| Wood, dest dist, c-l, drs, delv E. cities gal. | .23 | .25 | .22 | .25 | .22 | .36 |
| **U** | | | | | | |
| Urea, pure, 112 lb cases lb. | .14½ | .15½ | .14½ | .15½ | .14½ | .15½ |
| Fert grade, bgs, c.i.f. ton | | | | | | |
| c.i.f. S.A. points ton | 95.00 | 110.00 | 95.00 | 110.00 | 95.00 | 110.00 |
| Dom. f.o.b. wks ton | 95.00 | 101.00 | 95.00 | 101.00 | 95.00 | 101.00 |
| Urea Ammonia, liq., nitrogen basis ton | ... | 121.58 | ... | ... | ... | ... |
| **V** | | | | | | |
| Valonia beard, 42%, tannin bgs ton | 57.00 | nom. | 45.00 | 57.00 | 45.00 | 52.00 |
| Cups, 32% tannin, bgs ton | 39.00 | nom. | 27.00 | 39.00 | 30.00 | 37.50 |
| Extract, powd, 63% lb. | .05 | .06 | .05 | .06 | ... | .06 |
| Vanillin, ex eugenol, 25 lb tins, 2000 lb lots lb. | ... | 2.60 | 2.20 | 2.60 | 2.10 | 3.10 |
| Ex-guaiacol lb. | ... | 2.50 | 2.10 | 2.50 | 2.00 | 3.00 |
| Ex-lignin lb | | 2.50 | 2.10 | 2.50 | 2.00 | 2.25 |
| Vermilion, English, kgs lb | 2.88 | 2.97 | 1.50 | 2.97 | 1.45 | 1.69 |
| **W** | | | | | | |
| Wattle Bark, bgs ton | 38.50 | nom. | 34.50 | 38.50 | 36.00 | 41.75 |
| Extract, 60°, tks, bbls lb. | .05½ | nom. | .04 | .05½ | .04⅜ | .04⅝ |
| **WAXES** | | | | | | |
| Wax, Bayberry, bgs lb | .33 | .35 | .16⅞ | .35 | .16⅞ | .17 |
| Bees, bleached, white 500 lb slabs, cases lb. | ... | .37½ | .33 | .39 | .35 | .45 |
| Yellow, African, bgs lb | .24 | nom. | .18½ | .24 | .19 | .26 |
| Brazilian, bgs lb. | .28 | nom. | .21 | .28 | .22 | .29 |
| Chilean, bgs lb. | .28 | nom. | .21 | .28 | .22 | .29 |
| Refined, 500 lb slabs, cases lb | .30 | nom. | .25½ | .33 | .32 | .39 |
| Candelilla, bgs lb. | .16½ | .17 | .15¼ | .17 | .13½ | .16 |
| Carnauba, No. 1, yellow, bgs lb. | ... | ... | .36¾ | .46½ | .38 | .44 |
| No. 2, yellow, bgs lb. | ... | ... | .35¾ | .45 | .36 | .42 |
| No. 2, N. C., bgs lb. | .41 | nom. | .34 | .41 | .34 | .40 |
| No. 3, Chalky, bgs lb. | .36 | nom. | .27½ | .36 | .29 | .35½ |
| No. 3, N. C., bgs lb. | .38 | nom. | .28¾ | .38 | .30 | .35½ |
| Ceresin, dom, bgs lb. | .09 | .12½ | .08½ | .12½ | .08½ | .11½ |
| Japan, 224 lb cases lb. | .17 | nom. | .09¾ | .17 | .09¼ | .11 |
| Montan, crude, bgs lb. | no prices | | .11 | .11¼ | .11 | .12⅛ |
| Paraffin, see Paraffin Wax. | | | | | | |
| Spermaceti, blocks, cases lb. | .22 | .23 | .18 | .23 | .22 | .24 |
| Cakes, cases lb. | .23 | .24 | .19 | .24 | .23 | .25 |
| Whiting, chalk, com 200 lb bgs c-l, wks ton | 12.00 | 14.00 | 12.00 | 14.00 | 12.00 | 14.00 |
| Gilders, bgs, c-l, wks ton | ... | 15.00 | ... | 15.00 | ... | 15.00 |
| Wood Flour, c-l, bgs ton | 20.00 | 30.00 | 20.00 | 30.00 | 20.00 | 33.00 |
| Xylol, frt all'd, East 10* tks, wks gal. | ... | .29 | ... | .29 | .29 | .33 |
| Coml, tks, wks, frt all'd, gal. | ... | .26 | ... | .26 | .26 | .30 |
| Xylidine, mixed crude, drs lb. | .35 | .36 | .35 | .36 | .35 | .36 |
| Zein, bgs, 1,000 lb lots, wks lb. | ... | .20 | ... | ... | ... | ... |
| Zinc Acetate, tech, bbls, lcl, delv lb. | .15 | .16 | .15 | .21 | ... | .21 |

* Sept. 30. ** Sept. 30.

| | Current Market | | 1939 Low | 1939 High | 1938 Low | 1938 High |
|---|---|---|---|---|---|---|
| Zinc (continued): | | | | | | |
| Arsenite, bgs, frt all'd lb. | .12 | .12½ | .12 | .13 | .12½ | .13 |
| Carbonate tech, bbls, NY lb. | .14 | .15 | .14 | .15 | .14 | .15 |
| Chloride fused, 600 lb drs, wks lb. | .04¼ | .046 | .04¼ | .046 | .04¼ | .046 |
| Gran, 500 lb drs, wks lb. | .05 | .05¾ | .05 | .05¾ | .05 | .05¾ |
| Soln 50%, tks, wks 100 lb. | ... | 2.25 | ... | 2.25 | ... | 2.25 |
| Cyanide, 100 lb drs lb. | ... | .33 | | .33 | .33 | .38 |
| Dust, 500 lb bbls, c-l, delv lb. | ... | .08½ | .06½ | .08½ | .06 | .0740 |
| Metal, high grade slabs, c-l, NY 100 lb. | ... | 5.50 | 4.84 | 5.50 | 4.35 | 5.45 |
| E. St. Louis 100 lb. | ... | 5.35 | 4.60 | 5.35 | 4.00 | 5.05 |
| Oxide, Amer, bgs, wks lb. | .06¼ | .07½ | .06¼ | .07½ | .06 | .07½ |
| French 300 lb bbls, wks lb. | .06½ | .07¾ | .06½ | .07¾ | .06¼ | .07¾ |
| Palmitate, bbls lb. | .23 | .25 | .23 | .25 | .23 | .25 |
| Resinate, fused, pale bbls lb. | | .10 | | .10 | | .10 |
| Stearate, 50 lb bbls lb. | .21½ | .24½ | .20 | .24½ | .20 | .23 |
| Zinc Sulfate, crys, 400 lb bbl, wks lb. | ... | .029 | | .029 | .029 | .033 |
| Flake, bbls lb. | | .0325 | | .0325 | .0325 | .0375 |
| Sulfide, 500 lb bbls, delv lb. | .07¾ | .08 | .07¾ | .08⅞ | .08⅝ | .09¾ |
| bgs, delv lb. | .07½ | .07¾ | .07½ | .08⅝ | .08⅜ | .09 |
| Sulfocarbolate, 100 lb kgs lb. | .24 | .26 | .24 | .26 | .24 | .26 |
| Zirconium Oxide, crude, 73-75% grd, bbls, wks ton | 75.00 | 100.00 | 75.00 | 100.00 | 75.00 | 100.00 |
| ***Oils and Fats*** | | | | | | |
| Babassu, tks, futures lb. | ... | .07⅝ | .05⅞ | .07⅝ | .05⅛ | .06¾ |
| Castor, No. 3, 400 lb drs lb. | .09 | .09¾ | .08¼ | .10 | .09¼ | .10¾ |
| Blown, 400 lb drs lb. | .11¼ | .12 | .10¼ | .12 | .11¼ | .13 |
| China Wood, drs, spot NY lb. | ... | .28 | .15 | .28 | .10¼ | .15½ |
| Tks, spot NY lb. | .23 | .27 | .14½ | .27 | .095 | .15½ |
| Coconut, edible, drs NY lb. | .09⅜ | .10⅛ | .08⅛ | .10⅛ | .08⅛ | .09½ |
| Manila, tks, NY lb. | ... | .04⅝ | .02⅞ | .04⅝ | .03⅛ | .04¼ |
| Tks, Pacific Coast lb. | ... | .04⅜ | .02⅝ | .04⅜ | .02⅝ | .03¼ |
| Cod, Newfoundland, 50 gal bbls gal. | ... | ... | .29 | .35 | .35 | .52 |
| Copra, bgs, NY lb. | ... | .2625 | .0160 | .2625 | .0170 | .0235 |
| Corn, crude, tks, mills lb. | .07⅛ | nom. | .05⅛ | .07⅛ | .06⅜ | .08¼ |
| Refd, 375 lb bbls, NY lb. | ... | .09¾ | .07½ | .09¾ | .09¼ | .10½ |
| Degras, American, 50 gal bbls NY lb. | .09½ | .10 | .07 | .10 | .07½ | .08¼ |
| English, bbls, NY lb. | .10 | nom. | .07 | .10 | .07½ | .08¼ |
| Greases, Yellow lb. | .06½ | .06¾ | .03⅞ | .06¾ | .03½ | .05½ |
| White, choice, bbls, NY lb. | .07 | .07½ | .04½ | .07½ | .05 | .07 |
| Lard, Oil, edible, prime lb. | ... | .11¼ | .09 | .11¼ | .10¼ | .12¾ |
| Extra, bbls lb | ... | .10⅜ | .08 | .10⅜ | .08¾ | .10¾ |
| Extra, No. 1, bbls lb. | ... | .10⅛ | .07¾ | .10⅛ | .08⅝ | .09¾ |
| Linseed, Raw less than 5 bbl lots lb | | .116 | .092 | .116 | .089 | .115 |
| bbls, c-l, spot lb. | .108 | .11 | .084 | .11 | .081 | .102 |
| Tks lb. | .102 | .104 | .078 | .104 | .071½ | .096 |
| Menhaden, tks, Baltimore gal. | .35 | nom. | .21 | .35 | .34½ | .37½ |
| Refined, alkali, drs lb. | ... | .082 | .062 | .082 | .067 | .095 |
| Tks lb | ... | .076 | .056 | .076 | .061 | .087 |
| Kettle bodied, drs lb. | ... | .094 | .074 | .094 | .076 | .105 |
| Light pressed, drs lb | ... | .076 | .056 | .076 | .061 | .091 |
| Tks lb | ... | .07 | .05 | .07 | .05½ | .08 |
| Neatsfoot, CT, 20°, bbls, NY lb. | ... | .19¾ | .14¾ | .19¾ | .15¼ | .17¼ |
| Extra, bbls, NY lb | ... | .10⅛ | .08 | .10⅛ | .08⅝ | .10 |
| Pure, bbls, NY lb | ... | .16¾ | .10¾ | .16¾ | .10¾ | .12¼ |
| Oiticica, bbls lb | .21 | nom. | .09¼ | .21 | .09¼ | .12¾ |
| Oleo, No. 1, bbls, NY lb | ... | .12 | .07¼ | .12 | .08½ | .10½ |
| No. 2, bbls, NY lb | ... | .11¾ | .06¾ | .11¾ | .08 | .10 |
| Olive, denat, bbls, NY gal | ... | 1.40 | .82 | 1.40 | .86 | 1.20 |
| Edible, bbls, NY gal | 2.25 | nom. | 1.75 | 2.25 | 1.75 | 2.35 |
| Foots, bbls, NY lb | .10 | nom. | .06¾ | .10 | .07 | .09⅞ |
| Palm, Kernel, bulk lb. | ... | ... | .0340 | .036 | .0325 | .04½ |
| Niger, cks lb | ... | ... | .03⅝ | .03⅞ | ... | ... |
| Sumatra, tks lb | ... | ... | .0265 | .02¾ | .02⅝ | .0375 |
| Peanut, crude, bbls, NY lb. | ... | .08 | .06 | .08 | .07 | .08¼ |
| Tks, f.o.b. mill lb. | .07¼ | nom. | .05¼ | .07¼ | .06⅝ | .08 |
| Refined, bbls, NY lb. | .10½ | nom. | .08¾ | .10½ | .09¾ | .10¾ |
| Perilla, drs, NY lb | .14¼ | .15 | .09½ | .15 | .09¾ | .11¾ |
| Tks, Coast lb | .13½ | .14 | .089 | .14 | .09 | .11 |
| Pine, see Pine Oil, Chemical Section. | | | | | | |
| Rapeseed, blown, bbls, NY lb. | .15 | .15½ | .14 | .15½ | .14 | .14¾ |
| Denatured, drs, NY gal | .90 | nom. | .80 | .90 | .75 | .91 |
| Red, Distilled, bbls lb. | .09 | .09½ | .06¾ | .09½ | .07¾ | .10⅝ |
| Tks lb | ... | .08½ | .064 | .08½ | .06½ | .09¾ |
| Sardine, Pac Coast, tks gal | ... | .38 | .24 | .38 | .28 | .46½ |
| Refined alkali, drs lb. | ... | .082 | .062 | .082 | .067 | .095 |
| Tks lb | ... | .076 | .056 | .076 | .061 | .087 |
| Light pressed, drs lb | ... | .076 | .056 | .076 | .061 | .089 |
| Tks lb | ... | .07 | .05 | .07 | .05½ | .08 |
| Sesame, yellow, dom lb | ... | ... | .09 | .10½ | .10¼ | .10½ |
| White, dom lb | ... | ... | .09 | .10½ | .10¼ | .10½ |
| Soy Bean, crude Dom, tks, f.o.b. mills lb | .06½ | nom. | .04½ | .06½ | .05⅞ | .07 |
| Crude, drs, NY lb | .07⅛ | nom. | .05⅛ | .07⅛ | .06½ | .08 |
| Ref'd, drs, NY lb | .08⅜ | nom | .06⅜ | .08⅜ | .07⅝ | .097 |
| Tks lb. | ... | .07¾ | .05¾ | .07¾ | .0685 | .082 |
| Sperm, 38° CT, bleached bbls NY lb | ... | .103 | .09 | .103 | .10 | .102 |
| 45° CT, bleached, bbls, NY lb. | ... | .095 | .083 | .096 | .093 | .095 |
| Stearic Acid, double pressed dist bgs lb. | .12½ | .13½ | .10 | .13½ | .10 | .12 |
| Double pressed saponified bgs lb. | .12¾ | .13¾ | .10¼ | .13¾ | .10¼ | .12¾ |
| Triple pressed dist bgs lb. | .15½ | .16½ | .12¾ | .16½ | .13 | .15 |
| Stearine, Oleo, bbls lb. | .12 | nom. | .05½ | .12 | .05½ | .08½ |
| Tallow City, extra loose lb. | .07 | nom. | .04⅜ | .07 | .04¾ | .06⅞ |
| Edible, tierces lb. | .07¾ | nom. | .04½ | .07¾ | .06 | .07⅝ |
| Acidless, tks, NY lb | ... | .09¼ | .07 | .09¼ | .07¾ | .09¼ |
| Turkey Red, single, drs lb. | ... | ... | .06 | .08⅝ | .06¼ | .08½ |
| Double, bbls lb | ... | ... | .08¾ | .10⅞ | .09½ | .13 |
| Whale: Winter bleach, bbls, NY lb. | ... | .095 | .075 | .095 | .081 | .10 |
| Refined, nat, bbls, NY lb | ... | .091 | .071 | .091 | .077 | .096 |


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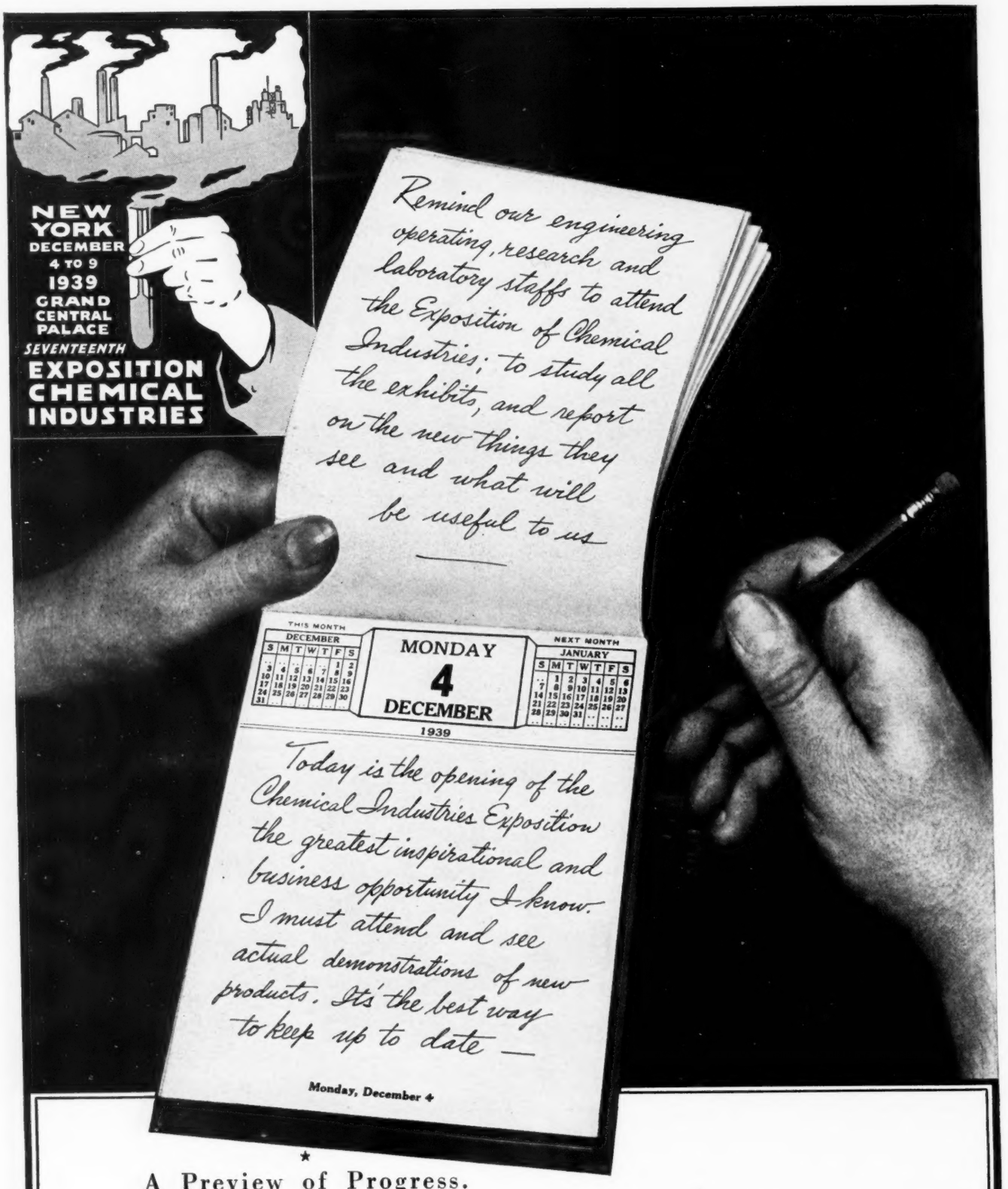
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Castor oil (replacement)
Coatings (paper)
Cosmetics, creams
Cooking oils
Ceramics, insulating
Cutting and spraying oils
Dental waxes
Dyestuff solvent
Dry cleaning
Disinfectants
Emulsifying agents
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Hair dressings
Insulating
Leather finishes, lubrication
Lubrication
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Paper and cardboard lubrication
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Pigment and abrasive suspension
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Synthetic oils
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Softeners
Suspending medium
Spring leaves lubricant
Surface tension (lowering)
Thickening agent
Textiles (lubricating, finishing)
Temporary binder, clays
Vegetable gums, oils (replacement)
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CHEMICALS BY GLYCO


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# "We"—Editorially Speaking

The learned scientist who reported at the Boston A.C.S. meeting the discovery that vitamin B-x will quickly turn silvered fur to black has "sort of let himself in for somethin'." If he can only show that it will keep gray hairs away he will be a national hero and his place in the hall of fame will be secure until a vitamin is found to prevent baldness.

❖❖❖❖

When Chairman O'Mahoney of the T. N. E. C. turns his staff of economic investigators loose on the war profiteers it is too much to hope that they will pay the tiniest bit of attention to the war hoarders.

❖❖❖❖

That jittery and greedy buyers are able to run up the price of any commodity in limited supply just about twice as far and almost three times as fast as the most selfish sellers can, is quite beyond the mentality of most of our present, precious officialdom.

❖❖❖❖

How could it be otherwise? For seven lean years official Washington has acted as if the law of supply and demand were a dead letter. It takes a very great intellect to try to understand what it does not believe exists.

❖❖❖❖

Come to think of it, maybe that's why the leaders of Germany have so consistently failed to understand the mentality of both their enemies and the neutral peoples.

❖❖❖❖

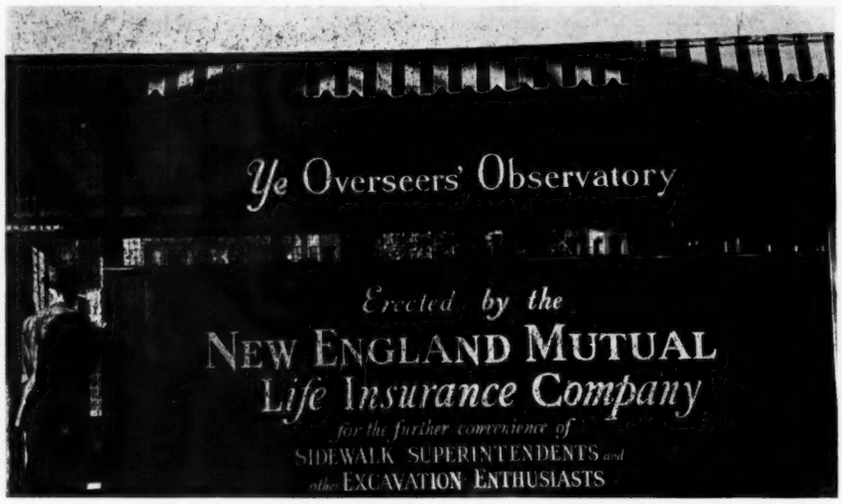
Three months ago "We" wrote an editorial pointing out why the American chemical industry does not want war. The proof of that pudding is supplied by Charlie Belknap and Edwin Cunningham in the September issue of *The Monsanto Magazine*. If you've not read "War Means Years of Blackouts" and "War Profits Don't Stick," nae doot but a post card to St. Louis will get you a copy.

❖❖❖❖

Our own idea of optimism is the idea of Dr. Thornwell Jacobs who is sealing up a Crypt of Civilization not to be opened till 8113 A. D.

❖❖❖❖

With a great deal of relief and with some degree of pride (both pardonable under the circumstances we hope) we report that the 15th Edition of the Buyer's Guidebook Number is fast nearing completion and it now looks as though it will be in your hands certainly by the end of this month. If there is a slight delay we trust that you will be patient. Sandwiching in a 675 page issue between our regular issues and also with the problem greatly complicated by two anniversary numbers in November and December both the editorial and mechanical difficulties have been tremendous.




**No mere "Sidewalk Superintendents Club" would do in good old Boston. One interesting diversion overlooked by the otherwise very efficient entertainment committee of the local A. C. S.**

You will find, as always, several new innovations and improvements, and, of course, all the new industrial chemicals and specialties developed since the 1938 edition will be included. To several hundred of our new subscribers who have been most patient about it we owe a special debt of gratitude.

❖❖❖❖

Our sincere congratulations to Dr. Gustavus Esselen, chairman of the committee on arrangements for the recent A. C. S. Boston Meeting, on a magnificent job. Some of the sub-committees were actively working 18 months in advance of the meeting.

❖❖❖❖

Dr. Eldon Van Romaine, author of "Naval Stores, 1919-1939—the "Creating Industries Series" article this month, was born in Fond du Lac, Wisc., 48 years ago. After graduating from Marquette University he opened his own consulting laboratories. In '20 he became a research chemist with The Newport Co., and has been with that organization ever since, specializing on rosin and turpentine. He likes the outdoors, and has quite a reputation as a hunter and fisherman up in the lake country of Wisconsin.

❖❖❖❖

Appropriate recognition seldom comes to our great poets, and editors are often accused of failure to do their plain duty. Lest we be so branded, we rush to give you the following, entitled: "Unprosecuted Cases of Misbranding," calling the special attention of both the Federal Trade Commission and the Food and Drug Administration to its contents.

No cream there is in Cream of Tartar;
Sugar of Lead lacks sucrose;
Milk of Magnesia has no milk;
And there's no glue in Glucose.

The moon's no source of lunar caustic,
And Gold Dust yields no gold;
Pearl Tapioca has no pearls,
Although as such it's sold.

Pig Iron has no ham or bacon.
Bull Durham never had
A taurine part—unless you count
The bull that's in its "ad."

All butter's gone from buttermilk,
And none was ever found in
Butter of Antimony or Zinc,
A fact that's most astoundin'.

And Old Crow Whiskey's growing is
Misbranding, just "becaws"
It never was distilled from crows—
Its name defies our laws.

DR. JEROME ALEXANDER.

## *Fifteen Years Ago*

*From our files of October, 1924*

**Ford begins production of methyl alcohol, ethyl acetate and calcium acetate at the new Iron Mountain wood distillation plant.**

**Procter K. Malin is elected to succeed E. D. Winkworth, retiring, as president of the Solvay companies.**

**Sidney Webb, president, British Board of Trade, announces that the British Government has vetoed the proposed agreement between British Dyestuffs Corp. and the German Dye Cartel.**

**Dr. Charles H. Herty, S.O.C.M.A. president, is the guest of William J. Hale, Dow Chemical, in Michigan for a hunting trip.**

# State of Chemical Trade

Current Statistics (Sept. 30, 1939)—p. 43

## WEEKLY STATISTICS OF BUSINESS

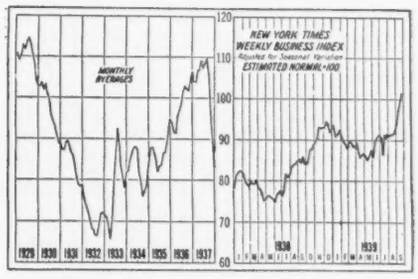
| Week Ending | Carloadings 1939 | Carloadings 1938 | Carloadings % of Change | Electrical Output* 1939 | Electrical Output* 1938 | Electrical Output* % of Change | Jour. of Com. Price Index | Nat'l Chem. & Drugs | Fertilizer Fats & Oils | Ass'n Fert. Mat. | Price Indices Mixed Fert. | Price Indices All Groups | †Labor Dept. Chem. & Drug Price Index | % Steel Activity | N. Y. Times Index Bus. Act. | Fisher Commodity Index |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sept. 2 | 721,748 | 648,029 | +11.3 | 2,357,203 | 2,148,954 | + 9.7 | 77.4 | 91.9 | 44.4 | 68.7 | 77.7 | 71.7 | 74.4 | 58.6 | 94.1 | 127.6 |
| Sept. 9 | 667,409 | 568,707 | +17.8 | 2,289,960 | 2,048,360 | +11.8 | 82.0 | 92.1 | 57.3 | 69.2 | 77.7 | 75.5 | 75.9 | 70.2 | 96.3 | 124.7 |
| Sept. 16 | 805,733 | 660,163 | +22.5 | 2,444,371 | 2,214,775 | +10.4 | 81.9 | 92.2 | 57.4 | 69.9 | 77.2 | 76.8 | 77.1 | 79.3 | 100.0 | 121.3 |
| Sept. 23 | 814,828 | 669,704 | +21.7 | 2,448,888 | 2,154,218 | +13.7 | 82.0 | 92.4 | **58.8** | 71.1 | 77.2 | **76.9** | 77.9 | 83.8 | 101.1 | 120.2 |

*K.W.H., 000 omitted †1926-1928 = 100.0.
*Bold-faced indices represent new peaks for* 1939.

## MONTHLY STATISTICS

| CHEMICAL: | August 1939 | August 1938 | July 1939 | July 1938 | June 1939 | June 1938 |
|---|---|---|---|---|---|---|
| *Acid, sulfuric* (expressed as 50° Baumé, short tons, Bureau of the Census) | | | | | | |
| Total prod. by fert. mfrs. | 161,791 | 131,106 | 139,248 | 109,969 | 140,580 | 114,199 |
| Consumpt. in mfr. fert. | 115,119 | 128,312 | 104,378 | 92,189 | 106,137 | 102,228 |
| Stocks end of month | 72,536 | 85,787 | 79,786 | 88,392 | 80,394 | 83,289 |
| *Alcohol, Industrial* (Bureau Internal Revenue) | | | | | | |
| Ethyl alcohol prod., proof gal. | 18,538,531 | 17,421,405 | 17,642,710 | 16,370,042 | 16,827,178 | 16,395,185 |
| Comp. denat. prod., wine gal. | 580,681 | 1,502,076 | 542,979 | 1,303,340 | 861,138 | 2,492,965 |
| Removed, wine gal. | 481,462 | 1,464,124 | 527,689 | 1,221,990 | 813,449 | 2,437,779 |
| Stocks end of mo., wine gal. | 767,661 | 815,966 | 670,229 | 779,849 | 655,994 | 699,772 |
| Spec. denat. prod., wine gal. | 8,608,994 | 6,343,617 | 6,893,739 | 5,407,077 | 7,304,529 | 5,376,531 |
| Removed, wine gal. | 8,720,379 | 6,202,383 | 6,867,719 | 5,419,830 | 7,130,302 | 5,374,308 |
| Stocks end of mo., wine gal. | 1,239,265 | 606,899 | 1,344,271 | 473,520 | 1,325,563 | 491,852 |
| Ammonia sulfate prod., tons *a* | 55,565 | 34,841 | 46,526 | 30,482 | 42,253 | 27,967 |
| Benzol prod., gal. *b* | 8,797,000 | 5,585,000 | 8,028,000 | 4,769,000 | 7,292,000 | 4,413,000 |
| Byproduct coke, prod., tons *a* | 3,666,068 | 2,494,471 | 3,364,799 | 2,176,612 | 3,089,721 | 2,066,530 |
| *Cellulose Plastic Products* (Bureau of the Census) | | | | | | |
| Nitrocellulose sheets, prod., lbs. | 759,235 | 725,363 | 697,609 | 457,492 | 704,235 | 429,439 |
| Sheets, ship., lbs. | 741,297 | 722,518 | 600,701 | 523,072 | 703,764 | 542,265 |
| Rods, prod., lbs. | 243,985 | 198,860 | 226,630 | 142,715 | 188,714 | 145,197 |
| Rods, ship., lbs. | 244,699 | 235,948 | 199,282 | 162,200 | 240,930 | 130,974 |
| Tubes, prod., lbs. | 65,426 | 52,283 | 54,495 | 33,371 | 63,772 | 37,011 |
| Tubes, ship., lbs. | 79,332 | 58,209 | 46,844 | 45,722 | 55,159 | 48,814 |
| Cellulose acetate, sheets, rod, tubes | | | | | | |
| Production, lbs. | 1,041,430 | 546,422 | 561,018 | 658,250 | 446,093 | 288,385 |
| Shipments, lbs. | 814,634 | 529,529 | 536,674 | 601,724 | 378,046 | 323,356 |
| Molding comp., ship.; lbs. | 967,367 | 484,022 | 604,476 | 303,327 | 702,854 | 414,692 |
| *Methanol* (Bureau of the Census) | | | | | | |
| Production, crude, gals. | ..... | ..... | 377,755 | 309,218 | 343,992 | 293,091 |
| Production, synthetic, gals. | ..... | ..... | 2,495,394 | 1,449,607 | 2,295,288 | 1,629,570 |
| *Pyroxylin-Coated Textiles* (Bureau of the Census) | | | | | | |
| Light goods, ship., linear yds. | 2,819,719 | 2,481,425 | 2,259,299 | 2,329,703 | 2,361,536 | 2,145,433 |
| Heavy goods, ship., linear yds. | 2,323,008 | 1,947,342 | 1,712,002 | 1,454,946 | 2,025,048 | 1,318,114 |
| Pyroxylin spreads, lbs. *c* | 5,580,850 | 4,848,722 | 4,350,562 | 3,882,270 | 4,710,415 | 3,341,135 |
| *Exports* (Bureau of Foreign & Dom. Commerce) | | | | | | |
| Chemicals and related prod. *d* | $15,000 | $12,000 | $13,459 | $9,709 | $12,800 | $12,200 |
| Crude sulfur *d* | $1,450 | $457 | $730 | $513 | $941 | $1,048 |
| Coal-tar chemicals *d* | $1,105 | $526 | $663 | $624 | $1,388 | $821 |
| Industrial chemicals *d* | $2,391 | $2,117 | $2,236 | $2,079 | $2,401 | $1,992 |
| *Imports* | | | | | | |
| Chemicals and related prod. *d* | $11,224 | $10,480 | $11,500 | $4,800 | $5,300 | $12,690 |
| Coal-tar chemicals *d* | ..... | ..... | $1,191 | $1,555 | $819 | $887 |
| Industrial chemicals *d* | $967 | $1,523 | $1,068 | $1,378 | $1,449 | $1,434 |
| *Payrolls* (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) | | | | | | |
| Chemicals and allied prod., including petroleum | 121.6 | 116.0 | 117.8 | 111.1 | 119.8 | 114.8 |
| Other than petroleum | 117.3 | 109.2 | 113.6 | 103.7 | 115.3 | 108.0 |
| Chemicals | 137.4 | 123.2 | 130.8 | 114.5 | 129.1 | 118.1 |
| Explosives | 109.1 | 97.6 | 102.8 | 89.4 | 96.3 | 80.2 |
| *Employment* (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) | | | | | | |
| Chemicals and allied prod., including petroleum | 112.1 | 109.3 | 110.4 | 105.0 | 109.2 | 105.2 |
| Other than petroleum | 109.6 | 106.0 | 107.6 | 101.0 | 106.7 | 101.4 |
| Chemicals | 119.4 | 112.2 | 117.1 | 107.8 | 114.5 | 109.7 |
| Explosives | 93.3 | 85.5 | 91.1 | 80.5 | 85.9 | 80.2 |
| Price index chemicals | 77.5 | 81.4 | 78.2 | 81.7 | 79.2 | 80.6 |
| Chem. and drugs | 74.6 | 77.7 | 75.0 | 77.7 | 75.7 | 76.3 |
| Fert. mat. | 67.2 | 67.3 | 67.5 | 66.9 | 69.5 | 69.5 |
| **FERTILIZER:** | | | | | | |
| *Exports* (long tons, Nat. Fert. Association) | | | | | | |
| Fertilizer and fert. materials | 141,171 | 146,636 | 154,800 | 112,944 | 136,016 | 99,717 |
| Ammonium sulfate | 5,672 | 5,579 | 3,008 | 1,526 | 2,298 | 1,131 |
| Total phosphate rock | 98,580 | 102,919 | 128,656 | 85,759 | 98,917 | 82,876 |
| Total potash fertilizers | 5,579 | 8,443 | 7,870 | 4,739 | 16,679 | 2,070 |
| *Imports* (long tons, Nat. Fert. Association) | | | | | | |
| Fertilizer and fert. materials | 75,485 | 77,452 | 88,313 | 57,769 | 107,640 | 86,484 |
| Ammonium sulfate | 11,161 | 9,374 | 2,335 | 9,961 | 4,089 | 8,682 |
| Sodium nitrate | 9,481 | 24,450 | 18,479 | 8,969 | 59,332 | 55,063 |
| Total potash fertilizer | 29,087 | 27,908 | 41,234 | 19,414 | 16,425 | 6,403 |

## INDUSTRIAL TRENDS




**Business:** Orders pouring in from every quarter, the heavy industries are now entering upon a period of activity whose peak will, at the least, attain that reached during 1937. N. Y. *Times* Index of Business Activity, on Sept. 23, stood at 101.3, nearly 16 points above the Index of the corresponding date of September last.

**Steel:** Mills are operating at from 75% to over 90% of capacity. Their biggest customers are railroads, shipping, automobile and power equipment fabricators. Steel mill equipment makers are benefitting from the intensive boom in steel-making.

**Automotive:** The 1940 models are, in general, meeting with very favorable reception. Some manufacturers have on hand a substantial number of unfilled orders that is increasing from day to day. In the last week of September, over 62,700 units were turned out—marking the busiest week for any like period since 1929.

**Retail Trade:** Sales in the first half of this year were valued at $17,900,000,000, about 6% better than in the first 6 months of '38, according to the Dept. of Commerce. Nation-wide department store sales showed little change during September, in the aggregate. Individual metropolitan areas reported gains over last year of from 2% to 20%. The prolonged summer weather continues to influence buying at a somewhat more than seasonal rate.

**Commodity Prices:** The U. S. Bureau of Labor Statistics wholesale price index advanced to 79.5 in the third September week. This was 6.3 points

State of Chemical Trade
Current Statistics (Sept. 30, 1939)—p. 43

## State of Chemical Trade

**Current Statistics (Sept. 30, 1939)—p. 44**

over the corresponding period a month earlier, and 1.4 points over the like '38 week.

**Textiles:** In one mid-September week, cotton mills sold more than 3 times the equivalent of their weekly capacity of print goods and continued to book orders, the volume of which will keep them busy for the rest of the year. In the first 7 months of '39, rayon yarn shipments (194,100,000 lbs.) were reported to have been 48% greater than in that same period of '38.

**Rubber:** Demand for replacement auto casings continued at a high level during August, with shipments representing the largest business for that month since 1929; deliveries totaled 4,919,140 units, as compared with 3,990,591 in August a year ago. Total shipments for the first 8 months of '39, 37,033,502 units, were nearly 50% greater than in the like '38 period. August crude rubber consumption in the U. S. was estimated at 50,481 long tons, a 23.7% rise over a year ago.

**Paper and Pulp:** U. S. wood pulp consumption in the first 6 months of '39 was 3,479,455 tons, 27% above the like '38 period, and the highest in the past 3 years. Pulp imports in that half-year period totaled 833,744 tons, 15% over the corresponding half of '38, although 27% below that period of '37. During the summer, the industry operated at from 70% to over 80% of capacity, although the earnings of major producers did not keep pace with the tonnage increase.

**Carloadings:** Shipments established a new 2-year high of 834,640 cars in the week ending Sept. 30.

**Electric Energy:** For the week ending Sept. 30, the electric output established another new high, 2,469,689,000 k.w.h. This figure is far above the output for the same week of '38, when 2,139,142,000 k.w.h. were consumed.

**Outlook:** The present industrial boom is certain to continue without pause for the rest of the year. While both wholesale and retail buying will be accelerated to a considerable degree, prices may be expected to increase proportionately. Much depends upon the fate of the Neutrality Act; just what will be the precise effect of its possible modification, or repeal, cannot be foreseen at the present time.

### MONTHLY STATISTICS (cont'd)

| | August 1939 | August 1938 | July 1939 | July 1938 | June 1939 | June 1938 |
|---|---|---|---|---|---|---|
| **FERTILIZER: (Cont'd)** | | | | | | |
| *Superphosphate e* (Nat. Fert. Association) | | | | | | |
| Production, bulk | 231,128 | 231,979 | 206,783 | 172,650 | 193,082 | 189,052 |
| Shipments, total | 155,780 | 146,963 | 98,565 | 131,557 | 78,904 | 80,940 |
| Northern area | 104,123 | 92,043 | 68,462 | 79,814 | 55,176 | 50,775 |
| Southern area | 51,657 | 54,920 | 30,103 | 51,743 | 23,728 | 30,165 |
| Stocks, end of month, total | 1,197,822 | 1,373,277 | 1,080,976 | 1,238,060 | 943,644 | 1,158,054 |
| *Tag Sales* (short tons, Nat. Fert. Association) | | | | | | |
| Total, 17 states | 154,865 | 128,701 | 51,633 | 54,805 | 93,825 | 117,073 |
| Total, 12 southern | 42,992 | 44,805 | 47,915 | 38,101 | 86,192 | 116,361 |
| Total, 5 midwest | 111,873 | 83,896 | 3,718 | 16,704 | 7,633 | 712 |
| Fertilizer payrolls | 61.1 | 65.6 | 63.4 | 63.1 | 64.7 | 65.0 |
| Fertilizer employment | 73.4 | 77.3 | 73.4 | 64.0 | 70.4 | 69.0 |
| Value imports, fert. and mat. *d* | $1,711 | $1,842 | $2,240 | $1,351 | $2,262 | $1,885 |
| **GENERAL:** | | | | | | |
| Acceptances outst'd'g *f* | $235 | $258 | $236 | $264 | $245 | $264 |
| Coal prod., anthracite, tons | 3,088,000 | 2,336,498 | 4,290,000 | 2,571,000 | 3,183,000 | 3,868,567 |
| Coal prod., bituminous, tons | 29,775,000 | 28,710,000 | 26,494,000 | 23,460,000 | 26,101,000 | 22,850,000 |
| Com. paper outst'd'g *f* | $201 | $209 | $194 | $210 | $248 | $253 |
| Failures, Dun & Bradstreet | 859 | 1,015 | 917 | 1,038 | 952 | 1,073 |
| Factory payrolls *i* | 89.9 | 77.3 | 84.4 | 70.6 | 85.9 | 70.8 |
| Factory employment *i* | 96.4 | 88.8 | 93.5 | 81.9 | 90.6 | 81.6 |
| Merchandise imports *i* | $175,756 | $165,516 | $168,925 | $140,836 | $178,953 | $145,869 |
| Merchandise exports *i* | $250,839 | $230,790 | $229,628 | $227,780 | $236,058 | $232,726 |
| **GENERAL MANUFACTURING:** | | | | | | |
| Automotive production | 99,868 | 90,494 | 209,343 | 141,443 | 309,720 | 174,670 |
| Boot and shoe prod., pairs | 42,948,923 | 42,252,371 | 33,617,827 | 30,741,853 | 31,776,359 | 26,897,189 |
| Bldg. contracts, Dodge *j* | $312,328 | $313,141 | $299,883 | $239,799 | $288,316 | $251,006 |
| Newsprint prod., U. S. tons | 80,000 | 67,436 | 74,932 | 86,256 | 80,562 | 65,382 |
| Newsprint prod., Canada, tons. | 236,975 | 220,303 | 227,630 | 202,546 | 240,545 | 201,546 |
| Glass Containers, gross‡ | 4,753 | 4,178 | 4,580 | 3,506 | 4,662 | 3,583 |
| Plate glass prod., sq. ft. | 10,450,000 | 7,676,078 | 6,212,209 | 5,505,768 | 9,288,788 | 5,956,386 |
| Window glass prod., boxes | 867,452 | 433,877 | 690,418 | 330,223 | 720,227 | 344,456 |
| Steel ingot prod., tons | 3,763 | 2,537 | 3,288,000 | 1,974,000 | 3,130,381 | 1,632,843 |
| % steel capacity | 61.9 | 42.9 | 56.5 | 33.4 | 53.4 | 28.4 |
| Pig iron prod., tons | 2,695 | 1,493 | 2,356,000 | 1,201,785 | 2,118,451 | 1,062,021 |
| U.S. cons'pt. crude rub., lg. tons | 50,481 | 38,170 | 43,880 | 32,209 | 47,259 | 30,629 |
| Tire shipments | 4,919,140 | 3,990,591 | 5,055,637 | 3,869,661 | 5,750,149 | 3,928,590 |
| Tire production | 5,491,664 | 4,037,715 | 4,510,122 | 3,286,864 | 4,869,862 | 3,036,012 |
| Tire inventories | 8,890,793 | 8,216,612 | 8,300,126 | 8,040,603 | 8,909,495 | 8,470,304 |
| Cotton consumpt., bales | 628,448 | 561,406 | 521,405 | 448,453 | 578,448 | 443,043 |
| Cotton spindles oper. | 22,012,186 | 22,152,526 | 21,915,362 | 21,915,394 | 21,788,286 | 21,142,408 |
| Silk deliveries, bales | 33,095 | 38,504 | 26,134 | 32,593 | 26,256 | 31,492 |
| Wool Consumption *z* | 38.9 | 33.2 | 30.1 | 23.5 | 32.9 | 21.7 |
| Rayon deliv., lbs. | 31,300,000 | 36,700,000 | 32,900,000 | 31,900,000 | 33,000,000 | 18,100,000 |
| Hosiery (all kinds) *t* | ..... | ..... | 7,708,958 | 6,593,296 | 8,694,258 | 7,562,160 |
| Rayon employment *i* | 309.8 | 281.8 | 297.0 | 270.5 | 303.6 | 265.4 |
| Rayon payrolls *i* | 288.4 | 264.5 | 283.2 | 249.5 | 301.8 | 242.1 |
| Soap employment *i* | 86.7 | 80.8 | 81.9 | 87.6 | 89.4 | 85.0 |
| Soap payrolls *i* | 103.2 | 94.9 | 99.0 | 87.1 | 93.5 | 85.9 |
| Paper and pulp employment *i* | 107.0 | 102.8 | 105.8 | 101.6 | 106.1 | 101.9 |
| Paper and pulp payrolls *i* | 107.2 | 102.0 | 101.2 | 96.9 | 104.4 | 94.9 |
| Leather employment | 85.4 | 78.5 | 85.5 | 89.3 | 88.1 | 81.8 |
| Leather payrolls *i* | 83.1 | 75.7 | 81.7 | 69.4 | 89.3 | 57.5 |
| Glass employment *i* | 100.7 | 83.7 | 96.3 | 74.7 | 93.0 | 79.3 |
| Glass payrolls *i* | 104.8 | 91.7 | 82.5 | 69.1 | 96.0 | 77.6 |
| Rubber prod. employment *i* | 82.8 | 72.3 | 78.7 | 68.7 | 80.2 | 70.6 |
| Rubber prod. payrolls *i* | 85.9 | 67.7 | 81.3 | 64.1 | 84.2 | 63.5 |
| Dyeing and fin. employment *i* | 122.0 | 111.8 | 119.7 | 97.0 | 106.4 | 98.0 |
| Dyeing and fin. payrolls *i* | 102.5 | 95.8 | 97.9 | 78.3 | 88.6 | 76.8 |
| **MISCELLANEOUS:** | | | | | | |
| Oils & Fats Index ('26 = 100) | 48.1 | 60.6 | 50.8 | 63.9 | 53.7 | 60.2 |
| Gasoline prod., bbls. | 46,899 | 50,071 | 45,467 | 48,913 | 50,861 | 45,718 |
| **PAINT, VARNISH, LACQUER, FILLERS:** | | | | | | |
| Sales 680 establishments | $34,448,530 | $30,182,013 | $30,758,617 | $27,946,084 | $38,504,857 | $33,936,706 |
| Trade sales (580 establishments) | $19,046,555 | $17,224,845 | $17,215,946 | $16,368,159 | $22,341,180 | $20,767,900 |
| Industrial sales, total | $12,153,308 | $9,894,867 | $10,713,443 | $8,806,128 | $12,585,957 | $9,763,856 |
| Paint & Varnish, employ. *i* | 122.5 | 115.2 | 122.2 | 110.8 | 119.3 | 113.0 |
| Paint & Varnish, payrolls *i* | 125.5 | 113.4 | 124.0 | 111.0 | 126.4 | 115.6 |

*a* Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000 000 omitted at end of month *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100; *j* 000 omitted 37 states; *p* Rayon Organon formerly an index was given now the exact poundage is given; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 384 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted.

## Chemical Earnings Up

Third quarter earnings will be much larger than was anticipated in mid-September, for the volume of chemical orders gained progressively during the last weeks of the month. If the demand increases at anything like the present rate, record earnings for the chemical industry as a whole may result in the final quarter of the year.

Estimates indicate that Du Pont may show from $1.25 to $1.30 a share for the quarter just ended, as compared with $1.06 in the June quarter and with $1.02 in the 3rd quarter of '37. Hercules Powder is expected to show at least 90c, as compared with 79c in the June period. Union Carbide and Carbon will report about 85c a share, as against 60c in the June quarter. Air Reduction may show in the vicinity of 60c in the September period, as compared with 47c in the previous quarter.

American Cyanamid's net may run approximately 45c a share, 4c better than in the previous period. Both Mathieson Alkali, which earned 16c in the 2nd quarter, and Commerical Solvents, which earned 16c in that quarter, should show a good recovery in the 3rd quarter.

## Hercules Powder Declares Preferred Dividend of 1½%

On Sept. 27, the board of directors of Hercules Powder Co. declared a regular quarterly dividend of 1½% on its preferred stock.

## Du Pont Stockholders Approve Capital Change

Stockholders of E. I. du Pont de Nemours & Co. in special meeting, on Sept. 29, approved proposed amendment to the certificate of incorporation calling for an increase in the authorized number of shares of preferred, $4.50 cumulative, to 3,000,000 from 500,000 and an increase in the redemption price of the stock to $120 per share from $115, plus accumulated dividends to date of redemption. The amendments were adopted in connection with the company's plan to retire its debenture stock.

The plan for retirement of the debenture stock calls for an exchange for the preferred. It is contemplated that directors will authorize such an exchange offer Oct. 9. Details of the offer, including the basis of exchange, will be determined by directors on that date.

## Durez Plastics & Chemicals Reorganized

Through a consolidation early last month with its affiliate, General Plastics, Inc., the Durez company assumed the name under which its products have been sold.

Public offering of $1,600,000 10-year 4½% convertible debentures of Durez Plastics & Chemicals, Inc., was made late last month. Debentures, which are due Sept. 1, '49, are priced at 100 and accrued interest. They are convertible into common stock at $45 per share before Sept. 1, '44, and thereafter at $50 until expiration of conversion rights on May 31, '49.

### Price Trend of Representative Chemical Company Stocks

| | Sept. 2 | Sept. 9 | Sept. 16 | Sept. 23 | Sept. 30 | Net gain last mo. | Price on Sept 30 1938 | 1939 High | 1939 Low |
|---|---|---|---|---|---|---|---|---|---|
| Air Reduction | 54 | 61⅛ | 64½ | 65⅞ | 65¾ | 15¾ | 59½ | 68 | 45¼ |
| Allied Chemical | 169 | 193¾ | 194 | 195 | 187 | 18 | 183 | 200½ | 151½ |
| Amer. Agric. Chem. | 17¾ | 21¾ | 23 | 23⅞ | 22¾ | 5 | ... | 24½ | 16 |
| Amer. Cyanamid "B" | 29 | 32⅛ | 32¼ | 32⅜ | 33½ | 4½ | 24½ | 35¾ | 18⅜ |
| Columbian Carbon | 85 | 92¼ | 85 | 87 | 90 | 5 | 88 | 94 | 73 |
| Commercial Solvents | 11 | 13⅞ | 14¾ | 14¼ | 14 | 3 | 10 | 16 | 8⅝ |
| Dow Chemical | 130 | 138½ | 140 | 139⅞ | 138½ | 8½ | 127 | 142½ | 101½ |
| Du Pont | 169½ | 185½ | 179 | 182½ | 184¼ | 14¾ | 134½ | 188½ | 126¼ |
| Hercules Powder | 79½ | 92 | 93 | 91½ | 89½ | 10 | 62 | 101½ | 63 |
| Mathieson Alkali | 24 | 34¼ | 34⅞ | 36¼ | 33⅞ | 9⅞ | 28 | 37⅜ | 20¾ |
| Monsanto Chemical | 103 | 113½ | 108 | 109 | 108¼ | 5¼ | 95½ | 114¾ | 85¾ |
| Std. of N. J. | 42⅞ | 50 | 52 | 51 | 48¾ | 5⅞ | 53¼ | 53½ | 38 |
| Texas Gulf Sulphur | 30½ | 36 | 36⅝ | 37⅞ | 36⅞ | 6¾ | 37⅜ | 38½ | 26 |
| Union Carbide | 82⅛ | 90⅞ | 89¾ | 92 | 91½ | 9⅛ | 84¼ | 94¼ | 65½ |
| U. S. Ind. Alcohol | 17⅞ | 23½ | 26½ | 27 | 25½ | 8⅜ | 21 | 29⅜ | 13½ |

### Earnings Statements Summarized

| Company: | Annual dividends | Net income 1939 | Net income 1938 | Common share earnings 1939 | Common share earnings 1938 | Surplus after dividends 1939 | Surplus after dividends 1938 |
|---|---|---|---|---|---|---|---|
| **Ferro Enamel Corp.:** | | | | | | | |
| Seven months, July 31 | y.75 | 310,046 | ..... | 1.59 | ... | ..... | ..... |
| **Industrial Rayon Corp.:** | | | | | | | |
| Twelve months, July 31 | f... | 363,637 | ..... | ... | .48 | ..... | ..... |
| **International Agricultural Corp.:** | | | | | | | |
| Year, June 30 | f... | 126,437 | 701,328 | p1.26 | .01 | ..... | ..... |
| **International Vitamin Corp.:** | | | | | | | |
| Year, June 30 | y.30 | 97,694 | 106,651 | .48 | .52 | ..... | ..... |
| **Masonite Corp.:** | | | | | | | |
| Period June 4 to Aug. 31 | 1.00 | 461,746 | 345,651 | .82 | .61 | ..... | ..... |
| Fifty-two weeks, Aug. 31 | 1.00 | 1,163,050 | 1,144,274 | 1.99 | 1.95 | ..... | ..... |
| **U. S. Smelting, Refining & Mining:** | | | | | | | |
| Eight months, Aug. 31 | y4.00 | 2,657,306 | 2,364,086 | 2.96 | 2.41 | ..... | ..... |
| **Valspar Corp.:** | | | | | | | |
| Twelve months, Aug. 31 | f... | 104,818 | 79,997 | p3.44 | p2.63 | ..... | ..... |

*f* No common dividend; *p* on preferred stock; y amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement.

### Dividends and Dates

| *Name* | *Div.* | *Stock Record* | *Payable* |
|---|---|---|---|
| Abbott Labs., E | 10c | Sept. 12 | Sept. 30 |
| Abbott Labs., q. | 40c | Sept. 12 | Sept. 30 |
| Abbott Labs., pf., q. | $1.12½ | Oct. 3 | Oct. 15 |
| Air Reduction, E. | 50c | Sept. 30 | Oct. 16 |
| Air Reduction, q. | 25c | Sept. 30 | Oct. 16 |
| Amer. Agric. Chem. | 30c | Sept. 18 | Sept. 29 |
| Amer. Cyanamid, Cl. A & B, q. | 15c | Sept. 15 | Oct. 2 |
| Amer. Cyanamid, pf., q. | 12½c | Sept. 15 | Oct. 2 |
| Amer. Maize-Products | 25c | Sept. 20 | Sept. 30 |
| Amer. Maize-Products, pf., q. | $1.75 | Sept. 20 | Sept. 30 |
| Bon Ami, Cl. A., q. | $1.00 | Oct. 16 | Oct. 31 |
| Bon Ami, Cl, B, q. | 62½ | Oct. 16 | Oct. 31 |
| Canadian Industries, Cl. A & B | $1.75 | Sept. 30 | Oct. 31 |
| Canadian Industries, pf., q. | $1.75 | Sept. 30 | Oct. 16 |
| Celanese Corp., pf., q. | $1.75 | Sept. 19 | Oct. 1 |
| Champion Paper & Fibre, pf., q. | $1.50 | Sept. 15 | Oct. 1 |
| Clorox Chem. Co., q. | 75c | Sept. 15 | Sept. 25 |
| Colgate-Palmolive-Peet, pf., q. | $1.50 | Sept. 5 | Oct. 1 |
| Devoe & Raynolds, pf., q. | $1.75 | Sept. 20 | Oct. 2 |
| Diamond Match | 25c | Nov. 10 | Dec. 1 |
| Diamond Match, pf., s. | 75c | Feb. 10 | Mar. 1 |
| Dow Chemical | 75c | Nov. 1 | Nov. 15 |
| Dow Chemical, pf., q. | $1.25 | Nov. 1 | Nov. 15 |
| Du Pont, $4.50 pf., q., | $1.12½ | Oct. 10 | Oct. 25 |
| Du Pont, deb. stk., q. | $1.50 | Oct. 10 | Oct. 25 |
| Eastman Kodak, q. | $1.50 | Sept. 5 | Oct. 2 |
| Eastman Kodak, pf., q. | $1.50 | Sept. 5 | Oct. 2 |
| Ferro Enamel Corp. | 25c | Sept. 11 | Sept. 25 |
| Formica Insulation, q. | 20c | Sept. 15 | Oct. 1 |
| Hercules Powder | 40c | Sept. 14 | Sept. 25 |
| Imperial Chem. Ind. i. | 3% | Sept. 27 | Dec. 8 |
| Industrial Rayon Corp. | 25c | Sept. 30 | Oct. 7 |
| International Salt, q. | 37½c | Sept. 15 | Oct. 2 |
| International Vitamin Corp. | 7½c | Sept. 20 | Sept. 30 |
| Johns-Manville | 75c | Sept. 11 | Sept. 25 |
| Johns-Manville, pf., q. | $1.75 | Sept. 14 | Oct. 1 |
| Koppers Co., 6% pf. | 75c | Sept. 21 | Oct. 1 |
| Liquid Carbonic, yr.-end | 20c | Sept. 11 | Sept. 30 |
| Liquid Carbonic | 20c | Sept. 11 | Sept. 30 |
| Mathieson Alkali Wks., q. | 37½c | Sept. 7 | Sept. 30 |
| Mathieson Alkali Wks., pf., q. | $1.75 | Sept. 7 | Sept. 30 |
| Merck & Co. | 25c | Sept. 20 | Oct. 1 |
| Merck & Co., 6% pf., q. | $1.50 | Sept. 20 | Oct. 1 |
| Monsanto Chem. Co., Cl., A & B, s. | $2.25 | Nov. 10 | Dec. 1 |
| Nat'l Oil Prods. Co., i. | 35c | Sept. 19 | Sept. 29 |
| North Amer. Rayon, pf., q. | 75c | Sept. 28 | Oct. 1 |
| Paraffine Cos., Inc., q. | 50c | Sept. 11 | Sept. 27 |
| Paraffine Cos., Inc., pf., q. | $1.00 | Oct. 2 | Oct. 16 |
| P'gh. Plate Glass | 75c | Sept. 12 | Oct. 2 |
| Procter & Gamble, 8% pf., q. | $2.00 | Sept. 22 | Oct. 14 |
| Quaker Oats Co., q. | $1.50 | Sept. 1 | Sept. 25 |
| Quaker Oats Co., pf., q. | $1.50 | Nov. 1 | Nov. 29 |
| So. Phosphate Corp. | 15c | Sept. 15 | Sept. 29 |
| Std. Wholesale Phosphate & Alkali Wks., p. | 20c | Dec. 5 | Dec. 15 |
| Union Carbide | 50c | Sept. 8 | Oct. 2 |
| United Carbon, q. | 75c | Sept. 16 | Oct. 2 |
| United Dyewood Corp., pf., q. | $1.75 | Sept. 22 | Oct. 2 |
| Valspar Corp., pf. | $1.25 | Sept. 27 | Sept. 30 |
| Victor Chem. Wks., q. | 25c | Sept. 20 | Sept. 30 |
| West Va. Pulp & Paper | 5c | Sept. 15 | Oct. 2 |

(E) extra; (i) interim; (s) semi-annual.

## Chemical Finances

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# Chemical Stocks and Bonds

| PRICE RANGE Sept. 1939 Last | Sept. 1939 High | Sept. 1939 Low | 1938 High | 1938 Low | 1937 High | 1937 Low | Sales | Stocks | Par $ | Shares Listed | Dividends* | Earnings** $-per-share-$ 1938 | 1937 | 1936 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NEW YORK STOCK EXCHANGE** | | | | | | | Number of shares Sept. 1939 | 1939 | | | | | | |
| 71 | 71½ | 53 | [illegible] | [illegible] | [illegible] | 46 | 5,100 | 29,900 | Abbott Labs. | No | 640,000 | $1.70 | 2.43 | 2.51 | 2.21 |
| 65¾ | 68 | 45¼ | 67⅞ | 40 | 80¼ | 44½ | 52,600 | 191,000 | Air Reduction | No | 2,563,992 | 1.50 | 1.47 | 2.86 | 2.79 |
| 187 | 200½ | 151½ | 197 | 124 | 258½ | 145 | 29,900 | 105,800 | Allied Chem & Dye | No | 2,214,099 | 6.00 | 5.92 | 11.19 | 11.44 |
| 22⅝ | 24½ | 16 | 28½ | 22 | 33¾ | 17⅞ | 25,900 | 58,800 | Amer. Agric. Chem | No | 627,987 | 1.43 | 2.23 | 2.95 | 1.57 |
| 10 | 11⅞ | 5½ | 15 | 9 | 30¾ | 8¼ | 29,900 | 67,300 | Amer. Com. Alcohol | No | 260,930 | .... | —2.05 | 3.23 | 4.55 |
| 32½ | 37 | 21 | 31½ | 20 | 46 | 22 | 5,900 | 21,100 | Archer-Dan.-Midland | No | 545,416 | 1.25 | .43 | 5.03 | 3.05 |
| 64 | 71 | 50 | 68 | 36 | 94 | 38 | 3,800 | 11,720 | Atlas Powder Co. | No | 249,163 | 2.25 | 2.69 | 4.40 | 4.21 |
| 123 | 127 | 116 | 126¼ | 105 | 133 | 101 | 970 | 2,850 | 5% conv. cum. pfd. | 100 | 68,597 | 5.00 | 14.77 | 20.90 | 20.85 |
| 26½ | 29⅛ | 13⅝ | 26⅜ | 9 | 41¼ | 13 | 162,000 | 723,900 | Celanese Corp. Amer. | No | 1,000,000 | .... | .26 | 2.04 | 2.33 |
| 104 | 109⅞ | 84 | 96 | 82 | 115 | 90 | 920 | 11,400 | prior pfd. | 100 | 164,818 | 7.00 | 15.05 | 27.07 | 27.25 |
| 13 | 17¼ | 11½ | 17 | 7⅛ | 25¾ | 8½ | 47,600 | 455,400 | Colgate-Palm.-Peet | No | 1,962,087 | .25 | 1.77 | —.35 | 1.40 |
| 103½ | 107 | 101⅞ | 104¼ | 78 | 104½ | 95 | 900 | 10,600 | 6% pfd. | 100 | 233,098 | 6.00 | 21.12 | 3.21 | 17.13 |
| 90 | 94 | 73 | 98½ | 53¾ | 125¾ | 65 | 3,000 | 27,800 | Columbian Carbon | No | 537,406 | 4.00 | 5.13 | 8.31 | 7.48 |
| 14 | 16 | 8⅝ | 12¼ | 5⅞ | 21¼ | 5 | 308,700 | 1,097,400 | Commercial Solvents | No | 2,636,878 | .... | —.11 | .60 | .85 |
| 62½ | 67½ | 54⅞ | 70¾ | 53 | 71¼ | 50½ | 35,400 | 156,300 | Corn Products | 25 | 2,530,000 | 3.00 | 3.18 | 2.52 | 3.86 |
| 155 | 177 | 150 | 177 | 162 | 171½ | 153 | 1,300 | 6,300 | 7% cum. pfd. | 100 | 245,738 | 7.00 | 39.69 | 32.96 | 46.76 |
| 23 | 32⅜ | 18 | 40⅞ | 25 | 76⅛ | 29½ | 5,990 | 19,440 | Devoe & Rayn. A. | No | 95,000 | 2.00 | —1.72 | 4.05 | 4.49 |
| 138½ | 142½ | 101½ | 141 | 87⅞ | 159¼ | 79½ | 14,600 | 56,000 | Dow Chemical | No | 945,000 | 3.00 | 3.91 | 4.15 | 4.48 |
| 184¼ | 188½ | 126¼ | 154¾ | 90½ | 180⅝ | 98 | 98,500 | 429,600 | DuPont de Nemours | 20 | 11,065,762 | 3.25 | 3.74 | 7.37 | 7.54 |
| 117¾ | 124⅛ | 112 | 120½ | 109½ | 112 | 107½ | 4,900 | 13,700 | 4½% pfd. | No | 500,000 | 4.50 | 87.27 | 165.48 | ..... |
| 129⅝ | 142 | 127 | 138½ | 130¾ | 135½ | 130 | 4,500 | 33,600 | 6% cum. deb. | 100 | 1,092,948 | 6.00 | 45.92 | 81.70 | 84.21 |
| 155½ | 186⅛ | 138⅛ | 187 | 121½ | 198 | 144 | 28,300 | 214,000 | Eastman Kodak | No | 2,250,921 | 6.50 | 7.54 | 9.76 | 8.23 |
| 156⅛ | 183½ | 155½ | 173 | 157 | 164 | 150 | 380 | 2,310 | 6% cum. | 100 | 61,657 | 6.00 | 281.22 | 362.45 | 306,64 |
| 34⅞ | 36 | 18¼ | 32 | 19⅞ | 32¼ | 18 | 84,900 | 163,400 | Freeport Texas | 10 | 796,380 | 2.00 | 1.87 | 3.30 | 2.43 |
| 9 | 10⅞ | 7 | 12⅛ | 6¾ | 19 | 8½ | 13,500 | 83,700 | Gen. Printing Ink | 1 | 735,960 | .50 | .62 | 1.32 | 1.32 |
| 19⅛ | 24½ | 14 | 28½ | 13 | 51½ | 19⅛ | 28,800 | 118,300 | Glidden Co. | No | 829,989 | .50 | —.29 | 2.62 | 3.29 |
| 39 | 47 | 34 | 51½ | 37 | 58⅛ | 43 | 400 | 5,300 | 4½% cum. pfd. | 50 | 199,940 | 2.25 | 1.03 | 12.72 | 15.43 |
| 104 | 110¼ | 93 | 111 | 76¾ | 117½ | 80⅛ | 1,800 | 15,000 | Hazel Atlas | 25 | 434,409 | 5.00 | 4.97 | 6.67 | 6.55 |
| 89½ | 101½ | 63 | 87 | 42¾ | 92½ | 50 | 35,200 | 105,800 | Hercules Powder | No | 1,316,710 | 1.50 | 1.95 | 2.97 | 3.24 |
| 131½ | 135½ | 128½ | 135¼ | 126¾ | 135½ | 125 | 310 | 4,750 | 6% cum. pfd. | 100 | 96,194 | 6.00 | 35.31 | 50.75 | 48.97 |
| 27¾ | 29½ | 16¾ | 30⅜ | 14⅜ | 47½ | 15 | 9,300 | 254,000 | Industrial Rayon | No | 759,325 | .25 | .24 | .34 | 2.24 |
| 35½ | 37⅞ | 17½ | 34½ | 15 | 64¼ | 20 | 3,300 | 56,100 | Interchem. | No | 289,618 | .... | .32 | 1.44 | 3.02 |
| 105 | 108 | 90 | 98 | 80 | 111½ | 92 | 60 | 4,670 | 6% pfd. | 100 | 65,661 | 6.00 | 7.39 | 12.26 | 18.97 |
| 3 | 3½ | 1½ | 3⅞ | 2 | 9½ | 2 | 7,400 | 35,800 | Intern. Agricul. | No | 436,048 | .... | | .16 | —1.55 |
| 29⅞ | 31 | 16 | 29 | 15 | 63½ | 18¼ | 3,700 | 9,900 | 7% cum. pfd. | 100 | 100,000 | 2.00 | 7.01 | 7.70 | .23 |
| 38¼ | 55¾ | 36½ | 57⅝ | 36⅞ | 73⅜ | 37 | 74,800 | 903,800 | Intern. Nickel | No | 14,584,025 | 2.00 | 2.09 | 3.31 | 2.40 |
| 37 | 38 | 29 | 30¼ | 19½ | 28¾ | 19½ | 300 | 13,500 | Intern. Salt | No | 240,000 | 2.00 | 2.29 | 2.11 | 1.70 |
| 20½ | 22 | 14½ | 24 | 19⅛ | 36 | 19¾ | 300 | 7,800 | Kellogg (Spencer) | No | 509,213 | 1.40 | .71 | 2.81 | 2.62 |
| 49 | 56¾ | 36½ | 58¾ | 23¼ | 79 | 33⅝ | 11,500 | 181,700 | Libbey Owens Ford | No | 2,509,750 | 1.25 | 1.57 | 4.19 | 4.14 |
| 15¾ | 19 | 13½ | 21½ | 12⅛ | 26⅜ | 14 | 1,400 | 58,200 | Liquid Carbonic | No | 700,000 | 1.25 | 1.81 | 2.37 | 1.58 |
| 33⅞ | 37⅜ | 20¾ | 36⅞ | 19¾ | 41¾ | 22 | 11,400 | 71,100 | Mathieson Alkali | No | 828,171 | 1.50 | 1.01 | 1.81 | 1.76 |
| 108¼ | 114¾ | 85¾ | 110 | 67 | 107½ | 71 | 3,800 | 81,100 | Monsanto Chem. | No | 1,241,816 | 2.00 | 2.35 | 4.40 | 4.01 |
| 114 | 121 | 110 | 117½ | 111 | 109 | 105 | 530 | 3,450 | 4½% pfd. A | No | 50,000 | 4.50 | 31.51 | 49.99 | ..... |
| 115 | 122½ | 112 | ... | ... | ... | ... | 810 | 7,770 | 4½% pfd. B | No | 50,000 | 4.50 | 31.51 | 49.99 | ..... |
| 23¾ | 27½ | 17⅞ | 31 | 17⅛ | 44 | 18 | 87,700 | 333,100 | National Lead | 10 | 3,095,100 | .50 | .75 | .95 | 1.71 |
| 153 | 173⅜ | 152 | 178½ | 154 | 171 | 153 | 500 | 4,800 | 7% cum. "A" pfd. | 100 | 213,793 | 7.00 | 26.03 | 22.86 | 33.83 |
| 136 | 145 | 135 | 145½ | 127 | 150 | 127 | 370 | 5,440 | 6% cum. "B" pfd. | 100 | 103,277 | 6.00 | 35.97 | 43.77 | 74.50 |
| 15⅞ | 17¾ | 8½ | 19½ | 9⅜ | 41¾ | 10⅛ | 154,200 | 376,000 | Newport Industries | 1 | 621,359 | .... | —.08 | 2.23 | .99 |
| 63½ | 70 | 50 | 76¼ | 40 | 103¾ | 51½ | 39,100 | 167,300 | Owens-Illinois Glass | 12.50 | 2,661,204 | 1.50 | 2.02 | 3.51 | 3.80 |
| 61⅞ | 64⅛ | 50⅝ | 59 | 39½ | 65½ | 43¼ | 34,100 | 199,200 | Procter & Gamble | No | 6,325,087 | 2.00 | 2.59 | 4.08 | 2.39 |
| 115½ | 119¾ | 112 | 122¼ | 114 | 118½ | 114½ | 500 | 13,270 | 5% pfd. | 100 | 169,517 | 5.00 | 101.81 | 157.05 | 94.14 |
| 14¾ | 17¼ | 9⅞ | 18⅜ | 10 | 34¾ | 14⅞ | 70,300 | 191,800 | Shell Union Oil | No | 13,070,625 | .70 | .70 | 1.44 | 1.35 |
| 99 | 107 | 98½ | 106½ | 93 | 105¾ | 91 | 2,100 | 18,200 | 5½% cum. pfd. | 100 | 341,000 | 5.50 | 33.18 | 60.59 | 57.20 |
| 24½ | 29½ | 15½ | 34¾ | 18½ | 60⅝ | 26½ | 29,400 | 90,600 | Skelly Oil | No | 995,349 | 1.00 | 2.27 | 6.07 | 4.42 |
| 94½ | 96½ | 92 | 98 | 84 | 102¾ | 88 | 10,000 | 14,000 | 6% cum. pfd. | 100 | 64,500 | 6.00 | 41.09 | 97.86 | 73.16 |
| 28⅛ | 30 | 22½ | 35⅛ | 24¾ | 50 | 26½ | 129,500 | 481,800 | S. O. Indiana | 25 | 15,272,020 | 1.00 | 1.82 | 3.16 | 3.09 |
| 48¾ | 53½ | 38 | 58¾ | 39¾ | 76 | 42 | 169,900 | 805,000 | S. O. New Jersey | 25 | 26,618,065 | 1.50 | 2.86 | 5.64 | 3.73 |
| 7½ | 9½ | 4 | 8 | 3⅞ | 15¾ | 5¼ | 67,400 | 148,500 | Tenn. Corp. | 5 | 853,696 | .... | .46 | 1.09 | .41 |
| 47½ | 50¾ | 32½ | 49¾ | 37⅝ | 65⅛ | 34¼ | 244,000 | 778,900 | Texas Corp. | 25 | 10,876,882 | 2.00 | 2.13 | 5.02 | 4.10 |
| 36⅞ | 38½ | 26 | 38 | 26 | 44 | 23¾ | 102,700 | 241,900 | Texas Gulf Sulphur | No | 3,840,000 | 2.00 | 1.81 | 3.02 | 2.57 |
| 91½ | 94¼ | 65½ | 90⅞ | 57 | 111 | 61¼ | 141,800 | 540,800 | Union Carbide & Carbon | No | 9,073,288 | 2.40 | 2.77 | 4.81 | 4.09 |
| ♦62¼ | 65¾ | 52 | 73½ | 39 | 91 | 36¾ | 5,800 | 36,100 | United Carbon | No | 397,885 | 3.25 | 3.78 | 5.91 | 5.54 |
| 25½ | 29⅜ | 13½ | 30¼ | 13½ | 43⅝ | 16¼ | 54,700 | 120,200 | U. S. Indus. Alcohol | No | 391,238 | .... | —1.08 | 1.24 | —.20 |
| 37⅝ | 40 | 16 | 28⅞ | 11½ | 39⅜ | 9¼ | 192,000 | 403,600 | Vanadium Corp. Amer. | No | 376,637 | .... | .61 | 2.22 | .40 |
| 26⅜ | 28½ | 18⅞ | 25¼ | 13½ | ... | ... | 15,800 | 66,000 | Victor Chem. | 5 | 696,000 | .90 | 1.05 | 1.01 | 1.16 |
| 5⅛ | 5¾ | 2½ | 5⅝ | 2¾ | 12¾ | 2⅜ | 78,300 | 131,200 | Virginia-Caro. Chem. | No | 486,122 | .... | —1.80 | —.05 | —2.44 |
| 32 | 33¾ | 17 | 32½ | 15¼ | 74¼ | 18½ | 26,900 | 57,000 | 6% cum. part. pfd. | 100 | 213,052 | .... | 1.90 | 5.88 | .44 |
| 28 | 30 | 15¼ | 20⅛ | 10 | 27¼ | 10¾ | 11,000 | 43,100 | Westvaco Chlorine | No | 339,362 | 1.00 | 1.52 | 1.46 | 1.17 |
| 34⅜ | 36 | 29 | 31½ | 20 | 34⅞ | 21½ | 7,800 | 21,800 | cum. pfd. | 30 | 192,000 | 1.50 | 4.19 | 4.09 | 3.26 |
| **NEW YORK CURB EXCHANGE** | | | | | | | | | | | | | | | |
| 33½ | 35¾ | 18⅜ | 30¼ | 15½ | 37 | 17⅝ | 113,900 | 362,400 | Amer. Cyanamid "B" | 10 | 2,520,368 | .45 | .91 | 2.09 | 1.77 |
| 500 | 110 | 76 | 92 | 50 | 124 | 69 | 1,475 | 11,035 | Celanese, 7% cum. 1st pfd. | 100 | 148,179 | 8.53 | 8.95 | 22.32 | 24.47 |
| 5 | 6¾ | 3 | 6¼ | 3 | 15 | 3 | 2,800 | 7,225 | Celluloid Corp. | 15 | 194,952 | .... | —2.73 | —.92 | —.80 |
| 4½ | 7⅜ | 4½ | 12 | 6½ | 14⅝ | 10½ | 100 | 3,100 | Courtauld's Ltd. | £1 | 24,000,000 | .29 | .26% | 8.64% | 8.30% |
| 7½ | 9¼ | 5 | 9⅞ | 6 | 10⅝ | 3½ | 7,100 | 14,800 | Duval Texas Sulphur | No | 500,000 | .... | .71 | .43 | .61 |
| 55 | 60 | 30 | 41¼ | 27 | 47½ | 31 | 3,700 | 7,700 | Heyden Chem. Corp. | 100 | 149,643 | 1.50 | 2.07 | 3.94 | 3.56 |
| 97½ | 117 | 90 | 115½ | 55 | 147½ | 77 | 8,600 | 50,300 | Pittsburgh Plate Glass | 25 | 2,142,443 | 1.75 | 3.00 | 8.53 | 7.15 |
| 90½ | 113½ | 81 | 117¾ | 66 | 154¾ | 72¼ | 8,500 | 36,300 | Sherwin Williams | 25 | 638,927 | 2.50 | 2.43 | 8.76 | 8.04 |
| 110½ | 115¾ | 106½ | 114⅛ | 107 | 114 | 106¼ | 570 | 2,380 | 5% cum. pfd. | 50 | 132,189 | 5.00 | 8.76 | 45.50 | 41.44 |
| **PHILADELPHIA STOCK EXCHANGE** | | | | | | | | | | | | | | | |
| 175 | 179 | 135 | 167 | 121½ | 179 | 115 | 1,650 | 3,125 | Pennsylvania Salt | 50 | 150,000 | 4.50 | 6.90 | 11.79 | 8.57 |

| PRICE RANGE Sept. 1939 Last | Sept. 1939 High | Sept. 1939 Low | 1938 High | 1938 Low | 1937 High | 1937 Low | Sales | Bonds | Date Due | Int. % | Int. Period | Outstanding $ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **NEW YORK STOCK EXCHANGE** | | | | | | | Sept. 1939 | 1939 | | | | |
| 99⅞ | 103½ | 98 | 105⅛ | 99½ | 109½ | 99 | 722,000 | 2,755,000 | Amer. I. G. Chem. Conv. | 1949 | 5½ M-N | $25,300,000 |
| 34⅜ | 36 | 19 | 38 | 25⅛ | 42½ | 23 | 206,000 | 776,000 | Anglo Chilean Nitrate inc. deb. | 1967 | 4½-5 J | 12,067,000 |
| 103½ | 108⅜ | 101¾ | ♦106⅛ | 102⅜ | 102⅞ | 100⅛ | 68,000 | 280,000 | Dow Chemical | 1951 | 3 J-D | 5,000,000 |
| 100 | 103½ | 99⅞ | 102¾ | 100 | 102 | 98½ | 9,000 | 179,000 | Int. Agric. Corp. 1st Coll. tr. stpd. to 1942 | 1942 | 5 M-N | 5,633,000 |
| 31¾ | 35 | 21½ | 35⅛ | 24¾ | 35⅜ | 21¼ | 214,000 | 1,263,000 | Lautaro Nitrate inc. deb. | 1975 | 4 J-D | 30,500,000 |
| 25 | 30 | 25 | 35⅛ | 24¾ | 25½ | 20½ | 8,000 | 15,000 | Ruhr Chem. | 1948 | 6 A-D | 1,500,000 |
| 90 | 91¼ | 88¾ | ... | ... | ... | ... | 648,000 | 648,000 | Shell Union Oil | 1954 | 2½ J-J | 85,000,000 |
| 101 | 105 | 98 | 104¾ | 90¼ | 102¾ | 94 | 85,000 | 648,000 | Skelly Oil | 1951 | 4 J-J | 9,000,000 |
| 99⅝ | 106¼ | 97⅛ | 105⅜ | 100 | 102 | 95 | 962,000 | 3,812,000 | Standard Oil Co. (New Jersey) deb. | 1961 | 3 J-D | 85,000,000 |
| 98 | 106½ | 94¼ | 103 | 98 | ... | ... | 877,000 | 2,954,000 | Standard Oil Co. (New Jersey) deb. | 1953 | 2¾ J-J | 50,000,000 |
| 105½ | 108⅜ | 102 | 105 | 95 | 105 | 93½ | 539,000 | 3,305,000 | Texas Corp. | 1951 | 3½ J-D | 60,000,000 |
| 99 | 105½ | 95¼ | ... | ... | ... | ... | 862,000 | 2,487,000 | Texas Corp. | 1959 | 3 A-O | 40,000,000 |
| 113 | 118½ | 96 | 101 | 77 | 111 | 81 | 467,000 | 850,000 | Vanadium Corp. conv. | 1941 | 5 A-O | 2,800,000 |

* Paid in 1938, including extras but excluding dividends paid in stock. ** For either fiscal or calendar year.

# Liquefied Petroleum Gases, 1938

Production and Sales—p. 3

## Sales Up 17% in '38

Despite uncertain economic conditions during 1938, sales of liquefied petroleum gases continued to gain, although at a lower rate than in recent years. Domestic deliveries of liquefied petroleum gases were 165,201,000 gals. in '38, as reported by 40 distributors to the U. S. Bureau of Mines. The '38 sales represent a 17% gain over the '37 total of 141,400,000 gals., comparing with a 33% increase in '37 over '36. All principal demands for liquefied petroleum gases were greater in '38 than in the previous year, with the exception of deliveries for industrial fuel, which use declined in '38 due to generally curtailed manufacturing operations. Sales for domestic consumption expanded noticeably in '38, increasing by 42% as the advantages of this type of fuel for cooking, heating, refrigeration, power, light, and air conditioning for the home, farm, and small establishments became more widely known. Requirements for chemical manufacturing and for internal combustion motor fuel mounted by over 20% in '38, compared with '37. Sales to gas manufacturing companies were 11% above the '37 total. Exports of liquefied petroleum gases, continuing the decline that has been in evidence during the last few years, were reported as 825,000 gals. in '38, compared with 1,984,000 gals. in '37 and 5,125,000 in '36. The total marketed production of these gases, including both domestic and export deliveries, was 166,026,000 gals. in '38, or 16% over the '37 requirement of 143,384,000 gals.

Last year, as well as in '37, total deliveries of liquefied petroleum gases were about equally divided between propane, butane, and propane-butane mixtures, pentane sales remaining relatively unimportant. Propane sales in '38, 54,130,000 gals., represent a 16% gain over the '37 total of 46,474,000 gals. Butane deliveries are likewise 16% greater—52,768,000 gals., as compared with 45,359,000 in '37. The market for propane-butane mixtures increased by 20%, from 46,694,000 gals. in '37 to 56,050,000 in '38. Sales of pentane, showing the first decline since the depression year of 1933, were reported as 2,253,000 gals. in '38, compared with 2,833,000 in '37.

### Domestic Sales in the Lead

A review of liquefied petroleum gas sales last year reveals that the domestic ("bottled gas") demand took the lead over industrial fuel requirements. Domestic sales of 57,832,000 gals. in '38 represent 35% of total deliveries, as compared with 29% in the previous year. This reversal in the market, however, is probably of a temporary nature, 1938 being a year of retarded industrial activity. Deliveries of industrial gas amounted to 38,849,000 gals. last year, as compared with 43,310,000 in '37. The extent of the decline (about 10%) in the use of these fuel gases for industrial purposes is illustrated by the fact that this particular use accounted for about 31% of the 1937 total demand, but for less than 24% in 1938.

Sales of these gases to gas manufacturers for direct resale, through their mains or for mixing with other gases, increased by 11% in '38, or to a total of 12,386,000 gals. Deliveries for this particular use, however, declined from 8% of the market production for '37 to 7.5% in '38. The volume of sales in '38 credited to chemical manufacturing, 32,299,000 gals., is 21% over the '37 demand of 26,792,000 gals., although this increase is well below that for '37 (when sales were nearly double the '36 quantity of 14,445,000 gals.). The steady growth in the sale of liquefied petroleum gases for use as fuel for internal-combustion engines continued through last year, when 20,914,000 gals. were delivered, a gain of 23% over the previous year's demand of 16,987,000 gals. These liquefied gases have proved to be quite satisfactory as fuel in heavy-duty automotive equipment, as well as in power engines for a great variety of jobs, so still further development along this line is anticipated.

**Sales of Liquefied Petroleum Gases, 1933-38**

(In thousands of gals.)

| Year | Propane | Butane | Propane-butane mixtures | Pentane | Total |
|---|---|---|---|---|---|
| 1933 | 15,835 | 19,056 | 3,226 | 814 | 38,931 |
| 1934 | 18,681 | 25,553 | 10,271 | 1,922 | 56,427 |
| 1935 | 26,814 | 34,084 | 13,492 | 2,465 | 76,855 |
| 1936 | 36,502 | 40,200 | 27,375 | 2,575 | 106,652 |
| 1937 | 46,474 | [1]45,399 | 46,694 | 2,833 | [1]141,400 |
| 1938 | 54,130 | 52,768 | 56,050 | 2,253 | 165,201 |

[1] Revised.

The market for propane increased from 46,474,000 gals. in '37 to 54,130,000 in '38. As in previous years, the larger share of propane was delivered for domestic use, the quantity increasing from 30,436,000 gals.('37) to 37,556,000 gals. in '38. Propane sold for industrial fuel showed a minor decline, from 14,490,000 gals. to 14,316,000 gals., although the quantity delivered for gas manufacturers increased noticeably from 1,077,000 gals. to 1,491,000 gals.

Butane sales increased 16% in the 1937-38 period, from 45,399,000 gals. to 52,768,000 gals. Butane is in greatest demand as an industrial fuel where temperature control in manufacturing processes is important; nevertheless, this principal use showed a decline, from 28,071,000 gals. in '37 to 23,405,000 gals. in '38. The domestic consumption of butane, which doubled in the 1936-37 period, continued the sharp upward trend in 1938, when sales for this purpose increased from 6,047,000 gals. in '37 to 13,194,000 gals. Domestic use of butane has displaced the gas manufacturing consumption from second place in importance of outlets. The use of butane as fuel in internal-combustion engines gained sharply in '38, when 5,025,000 gals. were reported—in sharp contrast to the 1,715,000 gals. of '37.

Propane-butane mixtures are important as solvents and raw material to chemical manufacturers, who buy more than half of the market production. Data released

**Marketed Production of Liquefied Petroleum Gases by Uses, Methods of Transportation, and Regional Distribution, 1937-38**

(Thousands of gallons)

| | Propane | Butane | Propane-butane mixtures | Pentane | Total 1938 | Per cent. 1938 | Total 1937 | Per cent. 1937 |
|---|---|---|---|---|---|---|---|---|
| By uses: | | | | | | | | |
| Domestic | 37,556 | 13,194 | 6,316 | 766 | 57,832 | 35.0 | 40,823 | 29.0 |
| Gas manufacturing | 1,491 | 8,270 | 2,617 | 8 | 12,386 | 7.5 | [1]11,175 | 7.9 |
| Industrial fuel | 14,316 | 23,405 | 1,112 | 16 | 38,849 | 23.5 | 43,310 | 30.6 |
| Chemical manufacturing | 347 | 43 | 30,496 | 1,413 | 32,299 | 19.6 | 26,792 | 18.9 |
| Internal-combustion-engine fuel | 380 | 5,025 | 15,509 | .... | 20,914 | 12.6 | 16,987 | 12.0 |
| All other uses | 40 | 2,831 | .... | 50 | 2,921 | 1.8 | 2,313 | 1.6 |
| Total | 54,130 | 52,768 | 56,050 | 2,253 | 165,201 | 100.0 | [1]141,400 | 100.0 |
| Per cent. 1938 | 32.8 | 31.9 | 33.9 | 1.4 | 100.0 | .... | .... | .... |
| Per cent. 1937 | 32.9 | 32.1 | 33.0 | 2.0 | 100.0 | .... | .... | .... |
| By methods of transportation: | | | | | | | | |
| Bulk: | 22,420 | 50,050 | 53,665 | 1,926 | 128,061 | 77.5 | [1]111,474 | 78.8 |
| Cylinders and drums | 31,710 | 2,718 | 2,385 | 327 | 37,140 | 22.5 | 29,926 | 21.2 |
| Total | 54,130 | 52,768 | 56,050 | 2,253 | 165,201 | 100.0 | [1]141,400 | 100.0 |
| Regional distribution: | | | | | | | | |
| Pacific Coast area | 6,983 | 8,072 | 20,083 | .... | 35,138 | 21.3 | 29,798 | 21.1 |
| All other areas | 47,147 | 44,696 | 35,967 | 2,253 | 130,063 | 78.7 | [1]111,602 | 78.9 |
| Total | 54,130 | 52,768 | 56,050 | 2,253 | 165,201 | 100.0 | [1]141,400 | 100.0 |

[1] Revised.

Liquefied Petroleum Gases, 1938
Production and Sales—p. 3

## Liquefied Petroleum Gases, 1938

**Exports—p. 4**

now, for the first time, show that the demand for these mixtures for chemical purposes totaled 12,233,000 gals. in '36; in '37, the trade more than doubled, to 24,601,000 gals. During the uneventful 1938 year, the gain was more conservative, for the '38 consumption for this market was only 30,496,000 gals. Sales of these mixtures for motor fuel increased from 14,994,000 gals. in '37 to 15,509,000 gals. in '38, the larger share of the demand being reported for Pacific Coast states. As domestic fuel, propane-butane mixtures are not relatively important, sales in that classification being on a more modest scale. However, domestic sales in the 1937-38 period doubled, from 3,504,000 gals. to 6,316,000 gals. Pentane sales declined from 2,833,000 gals. in '37 to 2,253,000 gals. in '38. Chemical consumption of pentane dropped from 1,907,000 gals. in '37 to 1,413,000 in '38.

Cylinder or drum shipments of liquefied petroleum gases showed a percentage gain of 22.5% in '38, as compared with a percentage gain of 21.0% in '37; this increase reflects the 42% gain in domestic sales during the 1937-38 period. Cylinder shipments for domestic use in '38 totaled 35,424,000 gals. out of a grand total of 37,140,000 gals. shipped in cylinders during 1938. In 1937, domestic cylinder consumption was 26,097,000 gals. out of the total cylinder consumption of 29,926,000 gals.

### PRICE RANGE OF LIQUEFIED PETROLEUM GASES, 1938-34

| | Jan. 1, 1939 | Jan. 1, 1938 | Jan. 1, 1937 | Jan. 1, 1936 | Jan. 1, 1935 |
|---|---|---|---|---|---|
| Propane, tks. .....lb. | 3c | 3c | 3c | 6c | 7c |
| Butane, tks. .....lb. | 2¼c | 2¼c | 4c | 4c | 2½c |
| Pentane, tks. .....gal. | 8½c | 8½c | 9c | 9c | 9c |

### Exports of Liquefied Petroleum Gases, 1936-38

(Thousands of gallons)

| | Propane | | | Butane | | | Propane-butane mixtures | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Countries of destination: | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 | 1936 | 1937 | 1938 |
| United Kingdom | 26 | .. | .. | .... | .... | .... | .. | 1 | .. | 26 | 1 | .. |
| Netherlands | .. | .. | .. | 602 | .... | .... | .. | .. | .. | 602 | .. | .. |
| France | 28 | .. | .. | 4,083 | 1,279 | .... | 17 | 22 | .. | 4,128 | 1,301 | .. |
| Italy | .. | 78 | 17 | .... | .... | .... | .. | .. | .. | .. | 78 | 17 |
| Canada | [1]10 | 66 | 151 | [1]219 | [1]229 | 235 | .. | .. | .. | [1]229 | [1]295 | 386 |
| Mexico | 39 | 1 | 19 | 84 | 209 | 382 | .. | 43 | .. | 123 | 253 | 401 |
| All other countries | 6 | 14 | 21 | .... | .... | .... | [2]11 | [2]42 | .. | 17 | 56 | 21 |
| Total | [1]109 | 159 | 208 | [1]4,988 | [1]1,717 | 617 | 28 | 108 | .. | [1]5,125 | [1]1,984 | 825 |

[1] Revised figures.

[2] Contains 1,000 gallons of pentane.

Note.—The data for the California area were compiled by E. T. Knudsen, Assistant Economic Analyst, United States Bureau of Mines, Los Angeles, California.

### Physical and Chemical Properties of the Principal Fuel Gases

| Formula | Methane $CH_4$ | Ethane $CH_3CH_3$ | Propane $CH_3CH_2CH_3$ | Butane $CH_3CH_2CH_2CH_3$ | Isobutane $CH_3CH_3CH.CH_3$ | Pentane $CH_3CH_2CH_2CH_2CH_3$ | Propylene $CH_3CH:CH_2$ |
|---|---|---|---|---|---|---|---|
| Mol. Wt. | 16.032 | 30.048 | 44.064 | 58.080 | 58.080 | 72.15 | 42.048 |
| B. P.° C. | —161.6 | —88.3 | —44.5 | 0.3 | —13.4 | 36.3 | —47.0 |
| Density of Liquid at 0° C. | ..... | 0.446 | 0.531 | 0.599 | 0.582 | ..... | 0.581 |
| Density of Vapor at 0° C., 760 mm. (Air = 1) | 0.554 | 1.04 | 1.56 | 2.07 | 2.07 | ..... | 1.46 |
| Critical Temp., 0° C. | —82.1 | 32.1 | 95.6 | 153.2 | 133.7 | 197.2 | 92.1 |
| Critical Pressure, lbs. per sq. inch absolute | 672 | 718 | 661 | 525 | 536 | ..... | 666 |
| Specific Heat at Constant Pressure Cp. | 0.593 | 0.397 | 0.365 | 0.351 | 0.351 | 0.4093 | ..... |
| Specific Heat at Constant Volume Cv. | 0.4495 | 0.325 | 0.315 | 0.317 | 0.316 | 0.3769 | ..... |
| Ratio of Specific Heats (Cp/Cv) | 1.319 | 1.224 | 1.153 | 1.108 | 1.111 | 1.086 | ..... |
| Explosive Limits in Air % by volume; lower, upper | 5.3–13.3 | 3.3–10.6 | 2–7 | 1.5–6.0 | 1.9–8.5 | 1.3–4.9 | 2.2–9.7 |
| Heat of combustion, Kg./cal. | 210.8 | 368.4 | 526.3 | ..... | 683.4 | 838.3 | 490.2 |


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**U. S. Chemical Patents**

**Off. Gaz.—Vol. 504—Vol. 505, Nos. 1, 2, 3, 4, 5—p. 135**

# *A Complete Check-List of Products, Chemicals, Process Industries*

## Agricultural Chemicals

Granulation on nongranular materials, such as fertilizer compounds in crude form. No. 2,167,432. George E. Cox, Niagara Falls, N. Y. and Walter G. McBruney, Niagara Falls, Canada, to American Cyanamid Co., New York, N. Y., a corp. of Me.

Processing of pig iron slags, to recover the fertilizer values therefrom. No. 2,168,169. Oskar Meyer, Bitterfeld, Ger., to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Ger.

Chemical treatment for seed planting and seed inoculation. No. 2,168,-332. Albert C. Fischer, Chicago, Ill.

Chemical process for treating seeds, bulbs, tubers and roots. No. 2,168,523. George Edward Heyl, Mill Hill, London, England.

Preparation of an agricultural meal, by mixing into the meal base acetone-insoluble matter derived from crude expressed vegetable oil, extruding and pelleting this mixture by pressure. No. 2,168,532. Charles W. McMath and Chester Logan Roots Jr., to Traders Oil Mill Co., all of Fort Worth, Tex.

Preparation of cyclo-derivatives of the fatty acids, as root-growth stimulators for the propagation of plants. No. 2,168,550. Percy W. Zimmerman and Albert E. Hitchcock, to Boyce Thompson Institute for Plant Research, Inc., all of Yonkers, N. Y.

Production of predigested vegetable foodstuff for animals. No. 2,168,-722. Charles Samuel Townsend, Ealing, England, to Wellesley Holdings, Ltd., London, England, a British company.

Preparation of phenylacetic acid derivatives as root-stimulating agents in plant propagation. No. 2,169,549. Percy W. Zimmerman and Albert E. Hitchcock, Yonkers, N. Y., to Boyce Thompson Institute for Plant Research Inc., Yonkers, N. Y., a corp. of N. Y.

Preparation of sulfurized glyycerin esters of unsaturated fatty acids as insecticidal and fungicidal compositions. No. 2,169,793. Frederick E. Dearborn, Washington, D. C., dedicated to the free use of the Public in the territory of the United States.

## Cellulose

Method producing cellulose esters from difficultly esterifiable dry wood pulp sheets. No. 2,164,416. Arnold Marschall, Baden, Germany, to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method producing a concentrated solution of cellulose acetate. No. 2,165,850. Wolfgang, Gruber, Matthies Thoma, and Hugo Zoebelein, Burghausen, Germany, to Dr. Alexander Wacker Gesellschaft, für elektrochemische Industrie, G. m. b. H., Munich, Germany.

Alcoholic treatment of ligneous cellulosic material. No. 2,166,540. Alan J. Bailey to Regents of the University of Minnesota, both of Minneapolis, Minn.

Method of aging woody materials to stimulate natural weathering, comprising exposing the wooden surfaces to oxides of nitrogen. No. 2,167,813. Eugene Plantrou, Rouen, France.

Method of processing regenerated cellulose, comprising treating with formaldehyde in the presence of an aromatic sulfocarboxylic acid. No. 2,167,914. Fritz Siefert, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Process of stabilizing cellulose esters, comprising treating with diaryl tertiary amines, in solution. Nos. 2,169,329-330. George W. Seymour, Cumberland, Md., to Celanese Corp. of America, a corp. of Del.

Process treating woody material to recover cellulose fibers, essentially unaffected from their natural state. No. 2,169,473. Fredrich Olsen, East Alton, Ill., to The Cellulose Research Corp., a corp. of Del.

## Chemical Specialty

Preparation a solidified product, comprising a polyhydroxy compound, a higher fatty acid sulfonate, and myristyl alcohol. No. 2,165,857. Simon Jacobowitz, Berlin-Charlottenburg, Germany, to Gustav Snoek, Berlin, Germany.

Manufacture of an adhesive-coated paper whose adhesive surface is protected by a layer of an aliphatic amine salt of a fatty acid. No. 2,167,711. Harold R. Dalton, Teaneck, N. J., to Postal-Telegraph-Cable Co., New York, N. Y., a corp. of N. J.

Addition compound of hydrogen peroxide, sodium peroxide, and water, the compounds being present in the molecular ration: 1/0.5/1. No. 2,167,997. Joseph S. Reichert, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

Coated surface cleanser, comprising a mixture of hydrocarbon diluents. No. 2,168,024. George R. Ensminger, New Brunswick, N. J. to E. I. du Pont de Nemours & Co., Wilmington, Del.

Insecticide, composing powdered plant insecticide material stabilized against photodecomposition with a white pigment coating. No. 2,168,064. Dalton B. Faloon, Beacon, N. Y., to Hammond Paint and Chemical Co., Inc., Beacon, N. Y.

Corrosion-inhibiting compound incorporated in a coating for tin food containers, said compound being a heterocyclic carbon-sufur-nitrogen compound. No. 2,168,107. Arthur E. Stevenson and Sylvester L. Flugge, Chicago, Ill., to Continental Can Co., Inc., New York, N. Y.

Capacitor composition, comprising a furan-type alcohol and an ionogen. No. 2,168,156. Frank M. Clark, Pittsfield, Mass., to General Electric Co., a corp. of N. Y.

Food product, being a deep-fried cassave flour dough, in the form of an expanded, exploded granule. No. 2,168,246. Thomas Lewis Shepard, London, England.

Abrasive article, the bonding medium being a prevulcanized, non-bending hard rubber particle mass imbedded in a resinoid bonding. No. 2,168,-281. Baalis Sanford, Worcester, Mass., to Norton Co., Worcester, Mass., a corp. of Mass.

Fluid composition, being a fluid pressure compound of acetylated glyceryl triricinoleate, together with diethylene glycol ether. No. 2,168,325. Ivor M. Colbeth, East Orange, N. J., to Baker Castor Oil Co., Bayonne, N. J., a corp. of N. J.

Acid resist powder for etching., No. 2,168,756. Donald B. Alnutt, St. Louis Mo., to Mallinckrodt Chemical Works, St. Louis, Mo.

Sound-recording disk of aluminum alloy, containing small amounts of tungsten or titanium and coated with an anodic oxide film. No. 2,168,826. Akira Miyata, Hongo-ku, Japan, to Zaidan Johin Rikagaki Kenkyujo, Hongoku, Tokyo, Japan.

Extreme pressure lubricant, comprising a lubricating oil and an alkylthioamide having at least 6 carbon atoms in the alkyl radical. No. 2,168,848. Anderson W. Ralston, to Armour & Co., both of Chicago, Ill., a corp. of Ill.

Cyanide salt bath for case hardening steel and iron, comprising a mixture of alkali metal cyanide, fluoride and an inert salt molten at the hardening temperature. No. 2,169,008. Louis Sarvis, Upper Darby, Pa., to E. F. Houghton & Co., Philadelphia, Pa., a corp. of Pa.

Preparation a perfume fixative cellulose acetate pellicle, containing an essential oil, di-ethyl phthalate and diacetone. No. 2,169,055. Ellsworth Byron Overshiner, Chicago, Ill., to Shellmar Products Co., Mt. Vernon, Ohio, a corp. of Del.

Hydraulic brake fluid, comprising an alkylene glycol ether mixture to which has been added castor oil such that the combination remains free-flowing and homogeneous at temperatures below freezing, and having less swelling action on rubber linings of the brake fluid conducting system. No. 2,169,231. Harvey R. Fife, Pittsburgh, Pa., to Carbide and Carbon Chemicals Corp., New York.

Detergent cleanser for copper alloys covered with fouled lubricant sludge comprising aqueous sodium, alkyl sulfate stearic and citric acids and sodium bicarbonate and aqua ammonia, the resultant alkalinite being equal to ammonia solutions of 11-12 Be. No. 2,169,344. Cyril S. Kimball, Brooklyn, N. Y.

Preparation an air-drying, film-forming metallic soap composition. No. 2,169,577. Theodore F. Bradley, Westfield, N. J., to American Cyanamid Co., New York, N. Y., a corp. of Me.

Paste composition for the soldering of steel and ferrous alloys below 1000° C. No. 2,169.659. Percy Warren Nobel, Unadilla, N. Y. and Richard Powell, London, Eng.

Preparation a toilet soap in cake form, containing 20-80% boric acid and 80-20% of water-soluble synthetic alkyl sulfonate detergent. No. 2,169,829. William G. Beckers, Bolton, N. Y.

Preparation a stable sodium hypochlorite solution. No. 2,170,108. Larry J. Barton, Oakland, Calif., to Clorax Chemical Co., Oakland, Calif., a corp. of Del.

Breakfast cereal whose particles are bonded together by an edible, solid fat. No. 2,170,155. Albert Musher, New York, N. Y., to Musher Corp., Elizabeth, N. J.

Baking powder composition, the active material being a mono-aryl acid hexaphosphate of an alkali or alkaline earth metal. No. 2,170,274. Willard L. Morgan, Calumet City, Ill., to American-Maize-Products Co., a corp. of Maine.

Synthetic fuel, comprising compressed block of lignite and straw, saturated with alcohol and sealed with paraffin to fix the alcohol as well as act as binder. No. 2,170,326. Olga Headland, Moorhead, Minn.

A salad dressing, stabilized with small proportions of hydrophillic colloid and one of the group consisting of acetic lactic and citric acids. No. 2,170,417. Harry M. Levin, Philadelphia, Pa.

Manufacture a salt block for animal feeding, comprising a sodium chloride containing a small amount of potassium iodide dispersed in a sugar syrup. No. 2,170,611. Douglas S. See, San Mateo, Calif., to Leslie-California Salt Co., a corp. of Del.

## Coal Tar Chemicals

Production of polychlorinated diphenyl ethers. No. 2,165,813. Carl F. Prutton, Cleveland, Ohio, to The Dow Chemical Company, Midland, Mich.

Preparation of meta-chloralkyl diphenyls. No. 2,167,639. Gerald H. Coleman, Lindley E. Mills and Garnett V. Moore, to the Dow Chemical Co., all of Midland, Mich.

Preparation carboxylic acid amides, by reacting a carbamic acid choride and a hydrocarbon, in the presence of a Friedel-Crafts catalyst. No. 2,168,161. Heinrich Hopff, Ludwigshafen-on-the-Rhine, Hans Kellermann, Mannheim, and Adolf Freytag, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method dehydrating tar emulsions. No. 2,168,309. Walter R. Alesander, Seattle, Wash.

Process for producing phenolphthalein. No. 2,168,346. Max Hubacher, Valley Stream, N. Y. to Ex Lax Inc., a corp. of New York.

Preparation of salts of dihexahydrocresyl sulfophthalates No. 2,168,-660. Otto Albrecht, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation of dibromoaminoanthraquinone derivatives. No. 2,169,196. Henry R. Lee, South Milwaukee, and David Z. Klein, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation of a solid granular mixture with starch of 2,-4-dinitro-6-methyl phenol. No. 2,169,240. Sheldon B. Heath and Merlin O. Keller, to The Dow Chemical Co., all of Midland, Mich.

Preparation anthraquinone, by oxidation of anthracene with tert-butyl chromate in tert-butyl alcohol solution. No. 2,169,368. Wallace J. Murray, Dedham, and Earl P. Stevenson, Newton, Mass.

Preparation a halogenated 2, 2'-diphenyl dialkoxyisobenzanthrone. No. 2,170,381. Edward T. Howell, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation of α-alkyl substituted benzimidazoles, the α-substituent being branched at the alpha carbon atom. No. 2,170,474. Charles Graenacher and Jules Meyer, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

## Coatings

Lining finish for food-containing sheet metal containers, comprising a mixture of asphalt and gilsonite in a hydrocarbon solvent, after which application is applied a coating of lupulin in a like solvent. No. 2,167,-638. Berton S. Clark, San Francisco, Calif., to American Can Co., New York, N. Y., a corp. of N. J.

Processing of acid-precipitated buttermilk casein materials into a homogeneous, viscous coating composition. Nos. 2,167,751-2. Chas. G. Harford, Wollaston, Mass., to Arthur D. Little, Inc., Cambridge, Mass., a corp. of Mass.

Baking enamel, consisting of a mixture of bronze powder and other pigment material, alkyl and urea-formaldehyde resins, and suitable vola-

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tile solvents. No. 2,168,212. Glenn H. Hicks, Detroit, Mich., to Acme White Lead and Color Works, Detroit, Mich., a corp. of Mich.

Apparatus for thinning varnishes and the like. No. 2,168,278. Harold R. Ayres, Chicago, Ill., and Seth L. Winslow, Parlin, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Dull finish cellulose derivative coating. No. 2,169,199. Raymond E. Thomas, Newburgh, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Cellulose nitrate coating for wood, having dissolved in the nitrate a polymerized vegetable oil and a resin, all dispersed in appropriate solvent mixture. No. 2,168,040. Walter Nebel, Parlin, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation a varnish base, comprising a natural-resin-modified condensate of formaldehyde with a crystalline keto-phenol. No. 2,169,361. Siegfried Kohn, to Resinous Products & Chemical Co., all of Philadelphia, Pa.

Manufacture a coating composition prepared from the condensation of a vinyl polymer and an alkaloid of the quinoline or isoquinoline group. No. 2,169,717. George H. Young, Pittsburgh, Pa., to Stoner-Mudge, Inc., a corp. of Pa.

Composition for manufacturing non-tacky coatings, comprising a cellulose derivative treated with the reaction product of a fatty acid with a monobasic acid of the benzophenone series. No. 2,170,632. Ralph T. K. Cornwell, Fredericksburg, Va., to Sylvania Industrial Corp., Fredericksburg, Va.

Manufacture a coating material, rubber latex being the basic ingredient. No. 2,170,043. Gladstone Walter Worral, Northwich, Eng., to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Preparation a waterproof coating, comprising calcium chloride, cement, and lye. No. 2,170,163. Claude V. Smith, Emporia, Kans.

## Dyes, Stains, Etc.

Preparation of a thionated indophenol dyestuff. No. 2,165,493. Herbert A. Lubs, Wilmington, Del., and George Clifford Strouse, East Aurora, N. Y., to E. I. du Pont de Nemours & Company, Wilmington, Del.

Preparation of complex anthranylamino-anilino conjugated azo dyestuffs. Nos. 2,167,779-80. Swanie S. Rossander, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Manufacture dyestuffs combining, in the one molecule alpha-aminoanthraquinone combined with an amino-azo compound by a 6-membered heterocyclic nitrogen-carbon ring. No. 2,167,804. Hans Gubler and Eduard Bernasconi, Basel, Switzerland, to firm of Society of Chemical Industry, in Basle, Basel, Switzerland.

Preparation a complex vat dyestuff of the anthraquinone series. No. 2,168,174. Otto Schlichting, Ludwigshafen-on-the-Rhine, Ger., to General Aniline Works, Inc., New York, N. Y., a corp. of Del.

Method dyeing a rayon fabric with a phenolaldehyde-amine resin by means of an acid direct dyestuff. Nos. 2,168,335-8. Winfield Walter Heckert, Ardentown, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Metal-containing triazo dyestuffs. No. 2,168,571. Hans Krzikalla and Walter Limbacher, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York, N. Y., a corp. of Del.

Diazoamino compounds soluble in water and process of preparing them. No. 2,168,800. Herbert Kracker and Richard Schmid, Frankfort-on-the-Main-Hochst, Germany, to General Aniline Works, Inc., New York, a corp. of Del.

Manufacture complex dyestuffs of the anthraquinone series. No. 2,168,947. Werner Zerweck and Ernst Heinrich, Frankfort-on-the-Main-Fechenheim, Germany, to General Aniline Works, Inc., New York, N. Y., a corp. of Del.

Preparation azo dyestuffs having sulfonic acid substituents, one of the rings attached to the azo linkage being a 6-membered isocyclic diacylamino-ring; said dyes being water-soluble and yielding orange to brown colors on fibres. No. 2,169,152. Otto Kaiser, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation of azo-dyestuffs, one of the nuclei attached to the azo group being a disubstituted-disulfonamide. No. 2,169,162. Pierre Petitcolas, Rouen, France, to Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies, Etablissements Kuhlman, Paris, France.

Conversion of cyanine and styryl alkyl quaternary salts into ternary amine derivatives. No. 2,169,434. George Schwarz, Antwerp, Belg., to Gevaert Photo Producten, N. V., Antwerp, Belg.

Method fixing a dyestuff on a fabric by aftertreatment with a hardened condensate of formaldehyde with a dicyandiamide derivative. No. 2,169,546. Gustave Widmer, Basel, and Robert Haller, Albert Landolt and Arthur Schurch, Reihen, Switzerland, to the firm Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture disazo dyestuffs, comprising coupling azotized aromatic diamines with orthohydroxy-aryl carboxylic arylide sulfonic acids. No. 2,169,970. Wolfgang Alt and Hans Krzikalla, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York, N. Y., a corp. of Del.

Manufacture of acid dyestuffs containing hydroxyl groups. No. 2,170,262. Chas. Graenacher, Basel, Franz Ackerman, Binningen, near Basel, and Heinrich Bruengger, Basel, Switzerland, to Soc. of Chem. Ind., in Basle, Basel, Switzerland.

Manufacture a salicylamido azo dyestuff, the amido-substituent being a pyrene ring derivative. No. 2,170,372. Walter Kern, Sissach, and Richard Tobler, Riehen, Switzerland, to the firm of Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture an acid wool dyestuff of the nitro-amino-anthraquinononesulfonic acid type. No. 2,170,385. Henry R. Lee, S. Milwaukee, and David X. Klein, Milwaukee, Wis., to E. I. du Pont de Nemours & Co., Wilmington, Del.

## Explosives

Manufacture an explosive composition, comprising dinitroethylene-urea. No 2,167,679. William H. Rinkenbach and Henry A. Aaronson, Dover, N. J.

Manufacture an explosive material, comprising a liquid explosive nitrate and mallow pith. No. 2,168,531. Bruce W. Manning, Grafton, Ill., to Illinois Powder Manufacturing Co., St. Louis, Mo., a corp. of Ill.

Manufacture an explosive solid material, comprising dissolving ammonium nitrate in liquid ammonia, dispersing nitrostarch therein, and evaporating to obtain a stable, solid, crystalline mixture of the 2 nitrocompounds. Nos. 2,168,562-3. Clyde Oliver Davis, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture gunpowder, comprising dissolving sucrose and potassium nitrate in hot water, adding to the solution pulverized coal and potassium chlorate, and then separating and screening the resultant mixture of solids. No. 2,167,849. Henry George Pert, Kansas City, Kans., ½ to Archie B. Pickell, Kansas City, Mo.

Production high-density blasting powder by compression of the wheel cake, after drying, to a density of at least 1.40. No. 2,168,020. Clarence W. Brooks, Jr., Wenonah, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation a deflagrating explosive composition, comprising 15-45% ammonium nitrate, intimately associated with at least 1% of aluminum powder. No. 2,168,030. Harrison H. Holmes, Woodbury, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation of pentaerythritol, comprising the condensation of acetaldehyde with formaldehyde, in the presence of aqueous, alkaline oxalate. Nos. 2,170,624-5. Joseph A. Wyler, to Trojan Powder Co., both of Allentown, Pa.

Preparation a colloidal explosive composition, comprising nitrostarch (25-75%) and nitro-isobutylglycerol (75-25%). No. 2,170,629. Jesse B. Bronstein Jr., Allentown, Pa., to Trojan Powder Co., Allentown, Pa.

## Fine Chemicals

As a pharmaceutical chemical, the mandelate of ethylene diamine. No. 2,165,471. Thomas R. Freeman and Willard S. Freeman, Washington, D. C.

Method preparing pure phenylmercuric salts. No. 2,165,533. Donald B. Bradner, Hamilton, Ohio, to The Hamilton Laboratories, Inc., Hamilton, Ohio.

Preparation a photographic developer whose alkaline ingredient is guanidine carbonate. No. 2,165,797. Louis C. Jones, Greenwich, Robert Bowling Barnes, Stamford and Garnet Philip Ham, Old Greenwich, Conn., to American Cyanamid Company, New York, N. Y.

Method separating pectin from its raw material source, by precipitation of said pectin with copper ion. No. 2,165,902. Philip Bliss Myers, Scarsdale, N. Y., to Sardik Incorporated, Jersey City, N. J.

Separation of bilirubine from impure bile salt-containing bilirubin liquors. No. 2,166,073. Jules D. Porsche, Edwin F. Pike, and John L. Gabby, Chicago, Ill., to Armour and Company, Chicago, Ill.

Preparation of p-aminobenzene sulfonamide maltoside, being soluble in cold water and whose alpha (D) rotation in 4% aqueous solution is plus 50-80°. No. 2,167,719. Harry Klingel and William C. MacLennan, Rensselaer, N. Y., to Winthrop Chemical Co., Inc., New York, N. Y., a corp. of N. Y.

Preparation aromatic salts of acetylamino carboxylates. No. 2,167,966. Carl N. Andersen, Wellesley Hills, Mass., to Lever Bros. Co., Cambridge, Mass., a corp. of Maine.

Preparation a photographic treating bath containing, as an active ingredient, an aliphatic amino-carboxylic acid. No. 2,168,181. Heinrich Ulrich and Karl Saurwein, Ludwigshafen-on-the-Rhine, Paul Goldacker, Dessau-Haideburg, and Georg L. Maiser, Dessau, Germany, to Agfa Ansco Corp., Binghamton, N. Y., a corp. of Del.

Manufacture an aqueous, stable milk of magnesia emulsion for pharmaceutical purposes. No. 2,168,228. Roger A. MacArthur, Wyoming, O., to The Philip Carey Mfg. Co., a corp. of O.

Production of hydroxamic acids from the corresponding primary nitrohydrocarbons, by hydrolyses with concentrated mineral acid. No. 2,168,305. Samuel B. Lippincott, Terre Haute, Ind., to Purdue Research Foundation, La Fayette, Ind., a corp. of Ind.

Trichlor-methyl aromatic carbinol ethers. No. 2,168,349. Lucas P. Kyrides, Webster Groves, Mo., to Monsanto Chemical Co., St. Louis, Mo., a corp. of Del.

Preparation of alkali metal chitins containing alkali steep liquor. Nos. 2,168,374-5. Clifford J. B. Thor, to The Visking Co., both of Chicago, Ill.

Process for preparing derivatives of halogenated sterols and the products thus obtained. No. 2,168,379. John Weijlard and Joseph R. Stevens, to Merck & Co., all of Rahway, N. J., a corp. of N. J.

Medicinal preparation, comprising a mixture of colloidal iodine with sodium cacodylate. No. 2,168,657. Oscar A. Strauss, Milwaukee, Wis.

Process of preparing glucosides having an action on the heart obtained from oleander leaves. No. 2,168,789. Max Bockmuhl and Gustav Ehrhart, Frankfort-on-the-Main-Hochst, Germany, to Winthrop Chemical Co., Inc., New York, N. Y., a corp. of N. Y.

Catalytic hydrogenation of the keto group of calcium 5-keto-gluconate. No. 2,168,878. Richard Pasternack, Brooklyn, and Ellis V. Brown, Jamaica, N. Y., to Charles Pfizer & Co., Brooklyn, N. Y., a corp. of N. J.

Preparation a stable, supersaturated solution of aqueous calcium gluconate. No. 2,168,879. Richard Pasternack, Brooklyn, N. Y., and Ellis V. Brown, Jamaica, N. Y., to Chas. Pfizer & Co., Brooklyn, N. Y.

Isoquinoline compounds and derivatives thereof, being colorless solids soluble in benzene, petroleum ether, chloroform, and ethyl ether. No. 2,168,929. Max Bockmuhl and Hans Hermann, Frankfort-on-the-Main-Hochst, Germany, to Winthrop Chemical Co., Inc., New York, N. Y., a corp. of N. Y.

Method of increasing the effective speed of a photographic element. No. 2,168,971. John C. Capstaff, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y., a corp. of N. J.

Low dye retention sub for photographic film. No. 2,169,004. Gale F. Nadeau, to Eastman Kodak Co., both of Rochester, N. Y., a corp. of N. J.

Reducing sugar product, comprising the conversion product of a starch, obtained by catalytic transformation in the presence of a molybdenum compound. No. 2,169,051. David P. Langlois, Decatur, Ill., to A. E. Staley Mfg. Co., Decatur, Ill., a corp. of Del.

Hydrocarbons from vacuum distillation of fish oil, comprising vitamin-like distillates from the high vacuum distillation of fish oil, said distillates having a formula approximating from $C_{15}H_{32}$ to $C_{19}H_{40}$. No. 2,169,192. James G. Baxter, Rochester, N. Y., by mesne assignments to Distillation Products Inc., Rochester, N. Y., a corp. of Del.

Production of vitamin A esters, comprising molecular distillation of the vitamin in its alcohol form from an animal oil, and acylating the distillate of vitamin alcohol. No. 2,169,195. Kenneth C. D. Hickman and Arthur O. Tischer, Rochester, N. Y. by mesne assignments to Distillation Products, Inc., Rochester, N. Y., a corp. of Del.

Method producing subtractive dyestuff photographic pictures. No. 2,169,320. Gerd Heymer, Wolfen, Kreis Btiterfeld, and Werner Schultze, Dessau, Germany, to Agfa Ansco Corp., Binghamton, N. Y., a corp. of Del.

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Method hardening an albuminous emulsion, by treatment with a ketone having no aldehydic properties and having at least one halogen substituent. No. 2,169,513. Johannes Brunken, Dessau, Anhalt, Germany, to Agfa Ansco Corp., Binghamton, N. Y., a corp. of Del.

Preparation carboxylic acid esters of aromatic sulfocarboxylic acids. No. 2,169,515. Otto Albrecht, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation a cellulose acetate solution capable of casting clear films. No. 2,169,537. Armin Ossenbrunner and Max Hagedorn, Dessau, Anhalt, and Gustav Wilmanns, Wolfen, Kreis Bitterfeld, Germany, to Agfa Ansco Corp., Binghamton, N. Y., a corp. of Del.

Preparation of salts of ethanolamino-methylene-sulfurous acid. Nos. 2,169,736-7. Jean G. Kern, East Aurora, N. Y., to National Aniline and Chemical Co., Inc., New York, N. Y.

Preparation of substituted sulfonic acid amides. No. 2,169,971. Robert Behnisch, Josef Klarer and Fritz Mietzsch, Wuppertal-Elberfeld, Ger., to Winthrop Chemical Co., Inc., New York, N. Y., a corp. of N. Y.

Manufacture a dry mixture of magnesium hydroxide and citrate, sugar, and sodium citrate, said mixture being stable when suspended and dissolved in water. No. 2,169,983. Bruce Walton, Glenbrook, Conn., to Chas. H. Phillips Chem. Co., N. Y. City, a corp. of Conn.

Preparation of perfumes containing a ketal of pyrocatechol. No. 2,169,984. Albert Weissenborn, Dessau-in-Anhalt, Ger., to Winthrop Chemical Co., Inc., New York, N. Y., a corp. of N. Y.

Preparation cellulose ethers, by alkylation of tertiary alcohol solutions of cellulose with alkyl halide; said cellulose having first been processed with concentrated, aqueous alkali. No. 2,170,009. Hans T. Clarke, New York, and Carl J. Malm, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y., a corp. of N. J.

Preparation mixed cellulose esters containing unsaturated acid radicals. No. 2,170,016. Charles R. Fordyce and Gordon D. Hiatt, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y., a corp. of N. J.

Preparation mixed dicarboxylic acid esters of polyhydroxy compounds and monobasic alcohols. No. 2,170,030. Carl J. Malm and Charles R. Fordyce to Eastman Kodak Co., all of Rochester, N. Y., a corp. of Del.

Preparation a piperazine derivative of a substituted ethanolamine-ether compound. No. 2,170,111. Herman A. Bruson, Phila., Pa., to Rohm & Haas Co., Phila., Pa.

Preparation of oxygen derivatives of the androstane and pregnane series. No. 2,170,124. Adolph Butenandt, Berlin-Charlottenburg, Germany, to Schering A. G., a corp. of Germany.

Preparation a coumarin-3-carbonylamide-(N-lower dialkyl-substituted). No. 2,170,127. Otto Dalmer and Fritz von Werder, Darmstadt, Ger., to Merck & Co., Inc., Rahway, N. J., a corp. of N. J.

Manufacture a cosmetic preparation containing menthyl anthranilate. No. 2,170,185. Marion Scott Carpenter, Nutley, N. J., to Givaudan-Delawanna, Inc., New York, N. Y., a corp of N. Y.

Preparation sulfonamides of 2-aminopyridines. No. 2,170,209. Carl Naegeli, Zurich, Switzerland, to Cilag, Chemisches Industrielles Laboratorium A. G., Shaffhausen, Switzerland.

Method forming water-soluble urea capsules for cosmetic purposes. No. 2,170,253. Karl Wilhelm Schmidt, Nuremberg, Germany.

Preparation an oxygen-absorbing solution, comprising an alkaline solution of alkali metal sulfide and a small amount of an aryl oxy-compound of the group consisting of pyrogallol, beta-chloro-mercuri-anthraquinone, 1-mercapto-anthraquinone-2-carboxyl c acid alpha-napthoquinone, and 1-chloro-anthraquinone-2-carboxylic acid. No. 2,170,596. Dorothy Quiggle, State College, Pa.

Preparation of 2, 4-dioxo-3, 3-dialkyl-tetrahydropyridine-6-carboxylic acids. No. 2,170,781. Otto Schnider, Basel, Switzerland, to Hoffmann-La Roche Inc., Nutley, N. J., a corp. of N. J.

Preparation of merocyanine dyestuffs, and photographic emulsions containing them; said dyestuffs being derivatives of compounds having rhodanine, benzoxazole, and thionaphthenone or barbituric acid nuclei. Nos. 2,170,803-7. Leslie G. S. Brooker, to Eastman Kodak Co., both of Rochester, N. Y., the latter being a corp. of N. J.

## Glass

Preparation an optical glass having an *n*D of at least 1.65; composition comprising less than 10% silica, and at least 20% of the heavy rare metal oxides. No. 21,175. Reissue. George W. Morey, Chevy Chase, Md., to Eastman Kodak Co., Jersey City, N. J., a corp. of N. J.

Chemical apparatus, and ground glass joint seal therefor. No. 2,169,194 William O. Geyer and Charles A. Weller, Bloomfield, N. J., said Weller to said Geyer.

## Industrial Chemicals

Production of phenyl-methyl-pyrazyl-phenyl-methyl pyrazolone, the initial reactants being phenylhydrazine, dehydracetic acid, and water. No. 2,165,445. Albert B. Boese, Jr., Pittsburgh, Pa., to Carbide and Carbon Chemicals Corporation, New York.

Method clarifying discolored organic esters recovered from the distillate produced in the manufacture of said esters. No. 2,165,450. Alfred K. Burke, Flint, Mich., and Thomas J. McKeon, Parlin, N. J., to E. I. du Pont de Nemours & Company, Wilmington, Del.

Method producing amines by the reduction with hydrogen of the corresponding nitrile, in the presence of catalytic cobalt. No. 2,165,515. Willi Schmidt, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method hardening oleic acid fats, without altering their chemical properties, comprising heating said fatty material to 140-240° C. for at least 1 hour, in the presence of one of the selenium metals. No. 2,165,530. Simon Hendrik Bertram, The Hague, Netherlands, to N. V. Industrieele Exploitatie Maatschappij, The Hague, Netherlands.

Method bleaching mineral matter to remove colored impurities reducible by hydrosulfite ion. No. 2,165,532. Frederick W. Binns, Quincy, Mass., to Virginia Smelting Company, Portland, Maine.

Gravity process for separating ore particles of different sp. gr. from that of the separating liquid. No. 2,165,607. George Blow, New York, N. Y.

Method preparing for consumption fresh animal blood. Nos. 2,165,721-2. James L. Norman, Oakland, Calif.

Production of a calcined rock phosphate being soluble in citrate solution. No. 2,165,729. Friedrich Rüsberg, Berlin-Niederschoneweide, Germany, to Kali-Chemie Aktiengesellschaft, Berlin, Germany.

Method separating carbon disulfide from coke-oven light oil, by treating the latter with a dilute mixture of ammonium and sodium hydroxides. No. 2,165,732. Benjamin D. Sontag, Clairton, Pa.

Method halogenating tertiary alcohols in the presence of a neutral compound capable of effecting metathesis with an acid. No. 2,165,782. Benjamin T. Brooks, Old Grenwich, Conn., to Standard Alcohol Co.

Method separating and concentrating hydrochloric acid gases from their admixture with sulfur dioxide in the exhaust gases of certain chemical processes. No. 2,165,784. Leslie James Burrage, Liverpool, England, to Imperial Chemical Industries Limited, Great Britain.

Method stabilizing a flavoring agent, comprising emulsifying said agent with proteolytic enzyme-hydrolyzed flour. No. 2,165,828. Hugh E. Allen, Evanston, Ill., to Albert G. McCaleb, Evanston, Ill.

Production a pickling bath for metals, comprising a non-oxidizing acid and a condensation product of formaldehyde, ammonia, and a phenol. No. 2,165,852. Jesse Harmon and David M. McQueen, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production of arsenic acid in bulk quantities. No. 2,165,944. Garnett L. Scott, Wilmington, Del., to General Chemical Company, New York, N. Y.

Production a soluble product from the solution of phosphoric oxide in molten phosphate rock, together with a soluble alkaline sulfate. No. 2,165,948. Edward A. Taylor, Shaker Heights, Ohio, to E. I. du Pont de Nemours & Company, Wilmington, Del.

Method processing distillery beer slops, to yield a dry, finely divided product. No. 2,165,950. Herman F. Willkie and Clair S. Boruff, Peoria, Ill., to Hiram Walker & Sons, Inc., Peoria, Ill.

Production of arsenic acid, by reacting arsenious acid with nitric oxide, recovering the nitrogen oxides thereby produced. No. 2,165,957. Bernard M. Carter, Montclair, N. J., to General Chemical Company, New York, N. Y.

Method producing alkylidene diethers or ester-ethers. No. 2,165,962. Martin Mueller-Cunradi and Kurt Pieroh, Ludwigshafen-on-the-Rhine, Germany to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Production of butanol and acetone, in the fermentation of whey. No. 2,166,047. Alfred Frey, Freising, Bavaria and Hans Glück and Hermann Oehme, Cologne-Kalk, Germany.

Preparation a dried egg white containing small amounts of tartaric acid and aluminum hydroxide. No. 2,166,070. Verne D. Littlefield, Beverly Hills, Calif., to Armour and Company, Chicago, Ill.

Production solutions of sulfur dioxide of known strength. No. 2,166,072. Arthur C. Pope and Walter E. Pfleger, Marinette, Wis., to Ansul Chemical Company, Marinette, Wis.

An improved continuous process for the production of combustible gas of high fuel value. No. 2,166,094. Alfred Johnson, Summit, and Morris M. Brandegee, Plainfield, N. J.

Manufacture of calcium arsenate. No. 2,166,246. Ivan L. Haag, Lakewood, Ohio, to E. I. du Pont de Nemours & Co., a corp. of Del., Wilmington, Del.

Zinc chloride—carboxylic acid preparation, the latter acid being one of the group comprising citric and tartaric acids. No. 2,166,253. Raymond J. Kepfer, Lakewood, and Arthur R. Telfer, Akron, Ohio, to E. I. du Pont de Nemours & Co., a corp. of Del., Wilmington, Del.

Process of fortifying cereal products with minerals. No. 2,166,797. Ferdinand A. Collatz, St. Paul, Minn., to General Mills, Inc., a corp. of Del.

Treatment of gas distribution systems. Nos. 2,167,138-141. Duncan B. Williams, Glen Ridge, N. J., to The United Gas Improvement Co., a corp. of Pa.

Agents of capillary activity, comprising essentially of dibutylphenyl-monoglycerine ether sulfuric acid esters. Nos. 2,167,325-6. Adolf Steindorff, Gerhard Balle and Paul Heimke, Frankfort-on-the-Main, and Karl Horst, Hofheim in Taunus, Germany, to I. G. Farbenindustrie, Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method of recovering condensing agents. No. 2,167,358. Anthony H. Gleason, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Method and means for increasing the strength of bentonic clay gels. No. 2,167,455. Winifred B. Hirschmann, Chicago, Ill., to American Colloid Co., Lead, S. Dak., a corp. of S. Dak.

Gas reaction method, converting methane and the like to an unsaturated hydrocarbon, such as acetylene. No. 2,167,471. Rudolf Auerbach, Neuenhagen, Berlin, Germany, to General Electric Co., a corp. of New York.

Process for producing aerated cementitious compositions and articles. No. 2,167,606. Conrad Gerard Francois Cavadine, Rochester, England, to Gyproc Products Ltd., London, England, a British limited liability company and himself.

Method converting ammonia to oxides of nitrogen, in the presence of a platinum-alloyed catalyst. No. 2,167,708. Fred E. Carter, Maplewood, N. J., Stanley L. Handforth, Grodon Heights, Del., and William E. Kirst, Woodbury, N. J.—½ to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del., ½ to Baker & Co., Inc., Newark, N. J., a corp. of N. J.

Method yielding simultaneously alkali-metal pyrophosphate and chlorine gas. No. 2,167,757. Fredrick J. Jelen, Anniston, Ala., to Monsanto Chemical Co., a corp. of Del.

Recovery of hydrogen sulfide from its solution in alkaline absorbents. No. 2,168,150. Hans Baehr and Karl Braus, Leuna, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Manufacture a fired ceramic body comprising talc and non-alkali metallic oxides including antimony oxide; said ceramic having a dielectric factor of not over 0.05%. No. 2,168,230. Samuel J. McDowell, Metuchen, N. J., to General Ceramics Co., a corp. of N. J.

Method producing mono-halogenated organic compounds, said compounds being liquid at the halogenating temperature. No. 2,168,260. Paul Heisel and Albert Hendschel, Gersthofen near Augsburg, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method of making zirconium oxide. No. 2,168,603. Charles J. Kinzie and Donald S. Hake, Niagara Falls, N. Y., to The Titanion Alloy Mfg. Co., New York, a corp. of Me.

Glue treatment. No. 2,168,626. Roy C. Newton and Frank L. De Beukelaer, to Industrial Patents Corp., both of Chicago, Ill., a corp. of Del.

Method concentrating fluorspar ores. No. 2,168,762. Julius Bruce Clemmer, Rolla, Mo., and Carl O. Anderson, Baxter Springs, Kans., to Mahoning Mining Co., Youngstown, O., a corp. of Del.

Thioamides and processes of preparing the same. No. 2,168,847. Anderson W. Ralston, to Armour & Co., both of Chicago, a corp. of Ill.

Process of concentrating ores, utilizing a flotation principle, in which the agent is a secondary amine of a higher alkyl radical. No. 2,168,849. Anderson W. Ralston and William O. Pool, to Armour & Co., all of Chicago, Ill., a corp. of Ill.

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Purification of gases, providing for the separation of organic sulfur-bearing compounds in the gases. No. 2,168,933. Fritz Giller, Mannheim, and Fritz Winkler, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Esterification of organic acids. No. 2,169,012. Herbert J. West, Mount Lebanon and Alphons O. Jaeger, Greentree, Pa., to American Cyanamid & Chemical Corp., New York, N. Y., a corp. of Del.

Method for treating sands and other granular material. No. 2,169,122. Joshua A. Crew, Zanesville, Ohio, to The Ayers Mineral Co., Zanesville, O., a corp. of O.

Method of producing hydrogen peroxide from solutions. No. 2,169,128. Heinrich Schmidt, Walddorf, Germany, to The Pennsylvania Salt Manufacturing Co., Philadelphia, Pa., a corp. of Pa.

Method recovering olefin oxides from their admixture with diluted gases. No. 2,169,210. Frederick R. Balcar, Stamford, Conn., to U. S. Industrial Alcohol Co., New York, N. Y., a corp. of West Va.

Manufacture organic esters, by the action of an olefine upon a fatty acid. No. 2,169,226. John A. Cormack, ½ to Carl W. Schuchardt, both of Milwaukee, Wis.

Production of filaments from polyvinyl alcohol. No. 2,169,244. Frank M. Hildebrandt, Baltimore, Md., and Norris M. Erb, Riviera Beach, Md., to U. S. Industrial Alcohol Co., New York, N. Y., a corp. of W. Va.

Production of glycerol and ethanol by fermentation of a sugar solution with yeast. Nos. 2,169-245-6. Frank M. Hildebrandt, Baltimore, and Norris M. Erb, Riviera Beach, Md., to U. S. Industrial Alcohol Co., New York, N. Y., a corp. of W. Va.

Process removing hydrocarbon impurities from molten raw sulfur. No. 2,169,261. Clarence O. Lee and Homer A. Smith, Port Sulphur, La., to Freeport Sulphur Co., a corp. of Del.

Method recovering hydrogen sulfide and hydrogen cyanide from gases, comprising washing the gaseous mixture with an ammoniacal suspension of iron ferrocyanide. No. 2,169,282. Honore Alphonse Joseph Pieters, Heerlen, Netherlands, to Dr. C. Otto & Co., Bochum, Germany, a German co., and ½ to Staatmijnen in Limburg, Heerlen, Netherlands, a concern of the Netherlands.

Method recovering elemental sulfur from the oxidation of petroleum gases containing sulfur-bearing impurities. No. 2,169,379. Hans Barkholt, Berlin-Halensee, Germany, to Zahn & Co., G. m. b. H. Berlin, Germany.

Purification manganese sulfate solutions by adding a xanthate to remove nickel and cobalt impurities. No. 2,169,540. Stephen M. Shelton, Reno, Nev

Apparatus for separating material into constituents of different specific gravity. No. 2,169,544. Gustave Andre Vissac, Calgary, Alberta, Can.

Electrolytic production of copper phosphate. No. 2,169,576. Charles F. Booth and Herbert J. Krase, Anniston, Ala., to Monsanto Chemical Co., a corp. of Del.

Preparation higher alkoxy acetonitriles of the type $ROCH_2CN$. No. 2,169,578. Herman A. Bruson and Rush F. McCleary, to The Resinous Prods. & Chem. Co., all of Phila., Pa.

Continuous process manufacturing conc. phosphoric acid. Nos. 2,169,-588-9. John E. Malowan, Dayton, O., to Monsanto Chem. Co., a corp. of Del.

Manufacture of nitric acid of concentration equal to at least 70%. No. 2,169,826. Rudolf Wendlandt, Piesteritz, near Halle-on-the-Salle, Germany, to Bayerische Stickstoff-Werke Aktiengesellschaft, Berlin, Ger-

Preparation a liquid chlorinated hydrocarbon mixture containing over 10% tetrachlorobenzene; said solution being fluid at ordinary winter temperatures. No. 2,169,872. Frank M. Clark, Pittsfield, Mass., and Walter M. Kutz, Pittsburgh, Pa., to General Electric Co., a corp. of N. Y.

Manufacture cement or mortar mix containing as one of the constituents the ingredients of waste sulfite liquors. No. 2,169,980. Edward W. Scripture Jr., Shaker Heights, Ohio, to The Master Builders Co., Cleveland, Ohio, a corp. of Ohio.

Alkali metal peroxide composition, stabilized with a small amount of sodium lignin sulfonate. No. 2,170,052. Moses Lieb Heim and Carl Fiedler, Leipzig, Germ. Fiedler to Heim.

Method automatically and continuously testing for the presence of dangerous amounts of flammable gas contained in admixture with combustion-supporting gases. No. 2,170,056. Georg Keinath, Berlin-Charlottenburg, and Heinz Gruss, Berlin-Wannsee, Germ., to Siemens & Halske, Aktiengesellschaft, Siemenstadt, near Berlin, Ger., a corp. of Ger.

Method bleaching tobacco with hydrogen peroxide. No. 2,170,107. Hermann Baier, Frankfort-am-Main, Germany, to Deutsche Gold und Silber Scheideanstalt vormals Roessler, Frankfort-am-Main, Germany.

Manufacture a stable, alkaline emulsion of bitument. No. 2,170,152. Claude L. McKesson to American Bitumuls Co., a corp. of Del., all of San Francisco, Cal.

Manufacture of sterile food products for canning. No. 2,170,196. George Grindrod, Oconomowoc, Wis.

Preparation a starch paste containing starch and a water-soluble acid salt of an amide containing the radical $CONH_2R$, where R is an acid of $K_{ds} = 1X10^{-2}$. Nos. 2,170,271-2. James F. Walsh, Chicago, Ill., and Willard L. Morgan, Cranston, R. I., to American Maize-Products Co., a corp. of Maine.

Preparation a liquid, water-soluble protein adhesive, comprising an aqueous solution of protein and aliphatic alkylolamine lactate. No. 2,170,-273. Willard L. Morgan, Calumet City, Ill., to American Maize-Products Co., a corp. of Maine.

Manufacture an electrical insulating material from cement, asbestos fibre, and a water-repellent material of the group consisting of paraffin, and the stearates of aluminum and zinc. No. 2,170,434. William R. Seigle, Mamaroneck, N. Y., to Johns-Manville Corp., New York, N. Y.

Manufacture of melamine from the group consisting of cyanamide and dicyandiamide. No. 2,170,491. Gustave Midmer, Basel, and Willy Fisch, Riehen, near Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Manufacture of a filter medium, by charring a carbohydrate material with admixed pulverized rock phosphate and ammonium phosphate, the latter decomposing at charring temperatures. No. 2,170,601. Stansbury M. Wilson and William H. Waggaman, Baltimore, Md., to Baugh & Sons Co., Philadelphia, Pa.

Preparation a sulfide rectifier, having an electrode of sulfur-sulfide composition and an impervious cover of heat-resistant and insulating enamel or the like. No. 2,170,634. Leslie James Ellison, London, Eng., to International Standard Electric Corp., New York, N. Y.

Process inhibiting evaporation from a body of water of limited surface, comprising the coating of the surface with a stable solution in mineral oil of an alkyl phenol. No. 2,170,644. Franklin C. Nelson, Roselle, N. J., to Stanco, Inc.

Manufacture tertiary aliphatic amines, consisting essentially of the treatment of secondary amines with a vaporizable aliphatic aldehyde, under hydrogen, at an elevated reaction temperature in the presence of a hydrogenation catalyst. No. 2,170,746. Bruno Christ, Ludwigshafen-am-Rhine, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-am-Main, Germany.

Method producing chlorinated methane derivatives, by chlorinating methane such that no free carbon is formed; method essentially comprises passing chlorine and methane gases through a narrow gap between 2 graphite surfaces, one of which is maintained at about 360° C. Said surfaces are spaced about 1/32 inch apart. No. 2,170,801. Harry Bender, Antioch, Calif., to The Dow Chemical Co., Midland, Mich.

Manufacture of propionic acid, by reaction of ethanol and carbon monoxide at 125-180° C., and at over 25 atm. pressure, in the presence of boron fluoride and water. No. 2,170,825. Donald J. Loder, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method dehydrating aqueous lower fatty acids, in the presence of withdrawing agents, by azeotropic distillation. No. 2,170,834. Donald F. Othmer, Brooklyn, N. Y., to Tennessee Eastman Corp., Kingsport, Tenn., a corp. of Va.

Processing of rock phosphate, comprising treatment of the wet ore with nitrosyl chloride, to yield soluble reaction products. No. 2,170,843. John W. Turrentine, Washington, D. C.

Manufacture of methoxy acetaldehyde, by passing monoalkyl ether of ethylene glycol into contact, at 300-425° C., with a dehydrogenating catalyst. No. 2,170,854. Nathan L. Drake, College Heights, Md., to Carbide and Carbon Chemicals Corp., a corp. of N. Y.

Manufacture of alkoxy acetones, by passing an alkoxyisopropanol at an elevated temperature over a dehydrogenating catalyst. No. 2,170,855. Henry C. Chitwood, Lakewood, O., to Carbide and Carbon Chemicals Corp., a corp. of N. Y.

Method extracting carotinoids from cellular, carotinoid-bearing materials, by digestion with alkali at elevated temperature and pressure, then suddenly releasing the pressure and extracting with solvent. No. 2,170,872. David D. Peebles, Eureka, Calif.

Method refining rosin, comprising treating its solution in an immiscible solvent with a nitroparaffin, the last extracting the impurities. No. 2,170,-956. Byron M. Vanderbilt, Terre Haute, Ind., to Commercial Solvents Corp., Terre Haute, Ind., a corp. of Md.

Preparation of ethylene glycol aryloxy-acetates. No. 2,170,995. Ernest F. Grether, William R. Shawver and Russell B. Du Vall, to the Dow Chemical Co., all of Midland, Mich.

Preparation of ethylene glycol di-(aryloxy-acetates). No. 2,170,996. Ernest F. Grether, William R. Shawver and Russell B. Du Vall, to The Dow Chemical Co., all of Midland, Mich.

Method converting organic sulfates to sulfonates, comprising treating the sodium salt of the sulfate ester with potassium sulfite. No. 2,171,117. Walther Schrauth, Berlin-Dahlem and Eric Schirm, Dessau, Ger., to "Unichen" Chemikalien Handels A. G. Zurich, Switzerland, a corp. of Sweden.

Preparation a crystalline, luminescent material containing a complex manganese compound of zinc and zirconium silicates. No. 2,171,145. Humboldt W. Leverenz, Collingswood, N. J., to Radio Corp. of America, a corp. of Del.

Preparation a reaction product from the treatment of paradichlorobenzene with 30% oleum at room temperature, diluting with cold water, and recovering the solid reaction product. No. 2,171,166. Willy Seel, Milan, Italy.

Process purifying laundry waste, thereby recovering the components of the soaps in solution. No. 2,171,197. Oliver M. Urbain and William R. Stemen, Columbus, O., to Charles H. Lewis, Harpster, O.

Process recovering fatty acids from solution, comprising passing their solution through a zinc oxide filter, and later treating said filter body to recover the acids adsorbed thereon. No. 2,171,198. Oliver M. Urbain and William R. Stemen, Columbus, O., to Charles H. Lewis, Harpster, O.

Process purifying laundry wastes, comprising recovering the fatty acid residues in a colloidal zinc oxide filter, and decolorizing the filtrate therefrom with chlorinated coal adsorbent. No. 2,171,199. Oliver M. Urbain and William R. Stemen, Columbus, O., to Charles H. Lewis, Harpster, O.

Method recovering the waste solids from laundry waters. Nos. 2,171,-200-01. Oliver M. Urbain and William R. Stemen, Columbus, O., to Charles H. Lewis, Harpster, O.

Method recovering fatty acids from waste discharges, by passing such solutions through a filter containing titanium dioxide. No. 2,171,-202. Oliver M. Urbain and Wm. R. Stemen, Columbus, O., to Charles H. Lewis, Harpster, O.

Method removing organic impurities from waste waters, comprising passing such wastes through a bed of scrap iron, charging the water prior to passage through said filter with sulfur dioxide and diffused air, such that the filtrate may be treated with lime hydrate to precipitate all the solid materials. No. 2,171,203. Oliver M. Urbain and Wm. R. Stemen, Columbus, O., to Chas. H Lewis, Harpster, O.

Manufacture edible products from dextrose, comprising adding by whipping dextrose hydrate into a syrup in which dextrose is insoluble, said syrup containing an edible colloid having beating properties. No. 2,171,-244. Theodore J. Otterbacher, Zion City, Ill., to Corn Products Refining Co., New York, N. Y., a corp. of N. J.

Method preparing a ceramic product, comprising suspending a selected ceramic material in water, and then adding a selected soluble silicate such that the whole undergoes a swelling action, thereby yielding a solid mass. No. 2,171,290. Floyd B. Hobart, Columbus, O., to Battelle Memorial Institute, Columbus, O.

Method killing insects and microorganisms, comprising heating to a selected temperature a mixture of carbon dioxide, water and air in the vapor phase, and passing the gaseous mixture into the space to be fumigated, the gas being introduced at high pressure and maintained at the maximum effective temperature. No. 2,171,315. Ivar Rennerfelt, Djursholm, Sweden.

Process for homogenizing pulverulent material, consisting in injecting currents of air of varied speed into non-contiguous locations of the material under treatment. No. 2,171,399. Edouard Hastert, Esch-Alzette, Luxemburg, to Louis Peters, Dusseldorf, Ger.

Manufacture of catalytically active carbonaceous materials, comprising treating freshly ground carbohydrate with conc. sulfuric acid, such that the former is added to the latter in such quantity that dehydration is instantaneous and that the temperature is maintained at 150-250° C., to insure complete volatilization of secondary condensable products. No. 2,171,408. Pieter Smit, Amsterdam, Netherlands, to N. V. Octrooien Maatschappij "Activit" Amsterdam, Netherlands.

Preparation a solid solution, comprising essentially 3-40 parts blood albumen, 97-60 of milk, and 0-25 of vegetable gum. No. 2,171,428. Carroll L. Griffith and Lloyd A. Hall, Chicago, Ill., to The Griffith Laboratories, Inc., a corp. of Ill.

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Preparation of sulfonates of polyaryl polyethers. No. 2,171,498. Herman A. Bruson, Philadelphia, Pa., to Rohm & Haas Co., Philadelphia, Pa.

Method of calcining lime, wherein the kiln is provided with an enlarged calcining zone adjacent the discharge end thereof. No. 2,171,507. Ray C. Newhouse, Wauwatosa, Wis., to Allis-Chalmers Mfg. Co., Milwaukee, Wis., a corp. of Del.

Manufacture monocalcium phosphate crystals containing impurities characteristic of blast furnace acid and having excess lime sufficient to reduce the neutralizing value to between 80 and 95. No. 2,160,700. William H. Knox, Jr., Nashville, Tenn., to Victor Chemical Works, a corp. of Illinois.

Method recovering sulfur dioxide from ammonium sulfite-bisulfite solutions. No. 2,161,055. Henry F. Johnstone and Alamjit D. Singh, Urbana, Ill., to Commonwealth Edison Co., Chicago, Ill.

Method for concentration of sulfur dioxide obtained from waste sulfur-dioxide-bearing gases. No. 2,161,056. Henry F. Johnstone and Alamjit D. Singh, Urbana, Ill., to Commonwealth Edison Co., Chicago, Ill.

Preparation a dehydrogenating catalyst for organic compounds, comprising reduction of selenium compounds on an adsorbent material of an argillaceous nature. No. 2,161,066. William Alfred La Lande, Jr., Upper Darby, Pa.

Process preparing ester condensation products from the reaction of a saturated ester with a ketone, in the presence of the hydride of a metal from the group consisting of alkali and alkali earth metals, said ketone having a carbon atom adjacent to the carbonyl group, which carbon atom having at least one hydrogen atom attached thereto and being essentially aliphatic in reaction. No. 2,158,071. Virgil L. Hansley, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Resiniferous material, the reaction product of a mixture of rubber and a terpene exposed to action of hydrogen halide. No. 2,158,138. John McGavack, Leonia, N. J., to United States Rubber Co., New York City.

Brittle, fusible resin, the reaction product of a phenol and a methylene compound formed in the presence of a small quantity of ammonia and a somewhat greater amount of rosin. No. 2,158,366. Norman D. Hanson, Bloomfield, N. J., and Ernest Kritzmacher, Manchester, Conn., to Bakelite Corporation, New York City.

Cork composition, being granulated cork incorporated with rubber, bodied tung oil, protein adhesive, a resinous binder, and a plasticizer. No. 2,158,469. Charles E. McManus, Spring Lake, N. J., to Crown Cork & Seal Co., Inc., Baltimore, Md.

Method of stabilizing polyvinyl acetal resins, consisting of subjecting to action of nitrous acid a solution of a compound of the group comprising the resins and the polyvinyl intermediates which are used to prepare them. No. 2,159,263. Charles R. Fordyce and Martti Salo, to Eastman Kodak Co., all of Rochester, N. Y.

Condensation products obtained from the treatment of waste sulfite liquors with phenols and formaldehyde; products obtained have resinous properties, are alcohol-soluble, and slightly soluble in weak alkali. No. 2,159,411. Fredrick J. Wallace, Brooklyn, N. Y., to Robeson Process Co., New York City.

Preparation a neutral ester of a dicarboxylic acid. No. 2,159,594. Lucas P. Kyrides, Webster Groves, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Method softening nitrocellulose plastic sheets. No. 2,159,926. Julius F. T. Berliner, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Production thermo-setting powder, from natural horn material treated with urea and an aldehyde. No. 2,159,981. Stefan Bakonyi, Dessau, Germany, to O. Kraus, Prague, Czechoslovakia.

Plasticizer for soluble cellulose ethers and esters, comprising one of the group including nitrated polymeric olefins of petroleum, having at least 6 carbon atoms. No. 2,160,133. Carleton Ellis, Montclair, N. J., to Standard Oil Development Co.

## Leather

Unhairing of hides and skins. Nos. 2,169,147-8. Alphons O. Jaeger, Mount Lebanon and Richard Herrlinger, Bridgeville, Pa., to The American Cyanamid & Chemical Corp., New York, N. Y., a corp. of Del.

## Metals and Alloys

Production a hard aluminum-magnesium-containing alloy suitable for being worked with cutting tools. No. 2,165,441. Adolf Beck and Hans Bohner, Bitterfeld, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method producing magnesium metal, by volatilizing the reduced metal from the furnace melt. No. 2,165,742. Harold Alexander Blackwell and William Lawrence Turner, Garston, England.

Dental casting cobalt alloy, containing 0.5-10.0% boron, 3-45% chromium, 0.2-2.0% silicon, and 0.2-5.0% manganese. No. 165,849. Cornell Joel Grossman, Millburn, N. J.

Soldering alloy for aluminum and other light alloys, containing 10% bismuth, 42% zinc, 22% tin, and lead (23%); also, 2.95% cadmium and 0.05% silver. No. 2,167,678. Georgie Purkardhofer and Gualtiero Battilano, Trieste, Italy, to Orestes De Martini, New York, N. Y.—2/3, and ½ to Matthew Paliaca, Jamaica, N. Y.

Maintenance getter, comprising a double fluoride of uranium and an alkali or alkaline earth metal. No. 2,167,762. Lloyd D. Lockwood, Madison, N. J., to Westinghouse Electric & Manufacturing Co., E. Pittsburgh, Pa.

Process for treating iron fluoride-containing residues to produce an iron oxide material; method comprises separating iron fluoride from its admixture with titanium fluoride (mixture obtained by fusing with ammonium fluoride a titanium-iron ore), and treating same with an inorganic hydrogen- and oxygen-containing compound at temperatures from 300-600° C., such that iron oxide and a volatilizable fluoride are the end-products. No. 2,167,784. Svend S. Svendsen, Madison, Wisc., to Sherwin-Williams Co., Cleveland, O.

Flotation apparatus for the concentration of mineral matter. No. 2,167,788. Arthur J. Weinig, Golden, Colo., to Morse Bros., Machinery Co., Denver, Colo.

Bird shot, comprising an alloy of lead with a metal which is anodic to lead in the electromotive series of metals, said metal being present in a quantity not substantially less than 2%. No. 2,167,828. Ralph L. Dowdell, St. Paul, and Robert G. Green, to Regents of the Univ. of Minnesota, all of Minneapolis, Minn.

Manufacture of ferrous alloys, comprising the steps of treating molten pig iron at 1600-2000° C., first with sodium sulfate and then with limestone, and casting the melt so treated. No. 2,167,859. George William Willis, Brighton, Eng.

Manufacture an alloy of copper and nickel, comprising the preparation of a paste containing lime and niter, and methylated spirit, and mixing the paste with pulverized nickel metal, adding this mixture to the copper, and fusing the whole. No. 2,168,129. Frank Leverick, Blaby, near Leicester, England, to Follsain Syndicate, Westminster, London, England.

Treating molten iron and steel with addition agents. No. 2,168,561. James H. Critchett, Douglaston, and Walter Crafts, Niagara Falls, N. Y., to Electro Metallurgical Co., a corp. of West Va.

Method and apparatus for thermochemically removing metal from bodies of ferrous metal. No. 2,168,581. Hans R. Pufahl, Chicago, Ill., and James H. Bucknam, Cranford, N. J., to The Linde Air Products Co., a corp. of Ohio.

Process and apparatus for the direct production of steel and other metals from ore. No. 2,168,597. Albert Auriol and Andre Auriol, Brussels, Belg.

Production of metallic magnesium. No. 2,168,750. Hellmuth Seliger and Otto Bretschneider, Bitterfeld, Germany, by mesne assignment to Magnesium Development Corp., a corp. of Del.

Producing etched surfaces on aluminum metal. No. 2,168,909. Ralph B. Mason, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa., a corp. of Pa.

Manufacture a hard metal body, comprising compressing a mixture of powdered tungsten carbide and cobalt metal into a molded body, embedding said molded body within a powdered mixture of highly refractive material and an amount of carbon necessary to produce a uniform, compact body, and heating the body in an inert atmosphere to sinter the same. No. 2,169,007. Johan Romp, Eindhoven, Netherlands, to N. V. Philips Gloeilampenfabrieken, Eindhoven, Netherlands.

Flotation process of concentrating metallic ores, comprising subjecting the ore to treatment in a bath containing a thiophane reagent. No. 2,169,313. Carl F. Williams, San Mateo, and William Trotter, San Francisco, Calif., to Minerals Separation North American Corp., N. Y. City, a corp. of Maryland.

Preparation foundry mold facings consisting principally of a fine granular material of the class consisting of zirconia, zirconium silicate, high alumina aluminum silicate, and titanium dioxide, bonded with cement. Nos. 2,169,384-6. John Howe Hall, Phila., Pa., to Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Production high tensile strength hypereutectoid iron castings of carbon content 0.90-2.00%. No. 2,169,464. James L. Gibney, Buffalo, N. Y.

Method separating magnesium from a mixture of metallic beryllium and magnesium. No. 2,170,394. Helmut von Zeppelin, Bitterfeld, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-am-Main, Germany.

Sintered hard metal alloy, containing refractory carbides. No. 2,169,090. Walther Dawihl, Berlin-Kohlhasenbruck and Karl Schroter, Berlin, Germany, to General Electric Co., a corp. of New York.

Method for soft soldering alloys containing aluminum. No. 2,169,098. Goodwin H. Howe, Scotia, N. Y., to General Electric Co., a corp. of New York.

Copper base alloys. Nos. 2,169,187-90. James M. Kelly, Trafford, Pa., to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corp. of Pa.

Chromium-titanium-silicon alloy. No. 2,169,193. George F. Comstock, Niagara Falls, N. Y., to the Titanium Alloy Manufacturing Co., N. Y. City, a corp. of Maine.

Method treating galvanized iron surfaces to render same corrosionproof. No. 2,169,584. Gilbert A. Kelley, Toledo, O., to Surface Combustion Corp., Toledo, O., a corp. of N. Y.

Gold alloy, containing 11-67% copper, 0.1-2.5% cobalt, 0.1-5.0% nickel, 2-12% silver, and 2-12% of zinc or cadmium. No. 2,169,592. Arthur W. Peterson, North Attleboro, Mass., to Metals & Controls Corp., Attleboro, Mass., a corp. of Mass.

Method preparing ferroalloys by direct reduction of the oxide of the alloying metal. No 2,169,741. Rene Perrin, Paris, France, to Societe d'Electrochimie d'Electrometallurgie et des Acieries Electriques d'Ugine, Paris, France, a corp. of France.

Permanent magnet alloy, containing 15-65% cobalt, 15-35% nickel, and 20-65% copper; said alloy having a coercive force above 100 oersted, and a remanence above 1,000 gauss. No. 2,170,047. Walter Dannohl and Hans Neumann, Berlin-Siemenssadt, Germany, to Siemens & Halske Aktiengesellschaft Siemensstadt, near Berlin, Germany, a corp. of Ger.

Method producing low-carbon iron granules. No. 2,170,158. Ivar Rennerfelt, Djursholm, Sweden.

Process for carbonization of light metals and light metal alloys. No. 2,170,259. Heinrich Borofski, Frankfort-am-Main, ½ to the firm Mettmanner Brittania-Warenfabrik W. Seibel Mettmann, Rhineland, all of Germany.

Alloy steel for motor valve parts, containing carbon (0.32%), chromium (5.50%), silicon (3.25%), nickel (2.42%), manganese (0.80%), sulfur (0.025%), phosphorus (0.025%), and the balance, iron. No. 2,170,267. Geo. R. Rich, to Rich Mfg. Corp., all of Battle Creek, Mich.

Electrodeposition of aluminum upon dissimilar metals, comprising passing direct current between aluminum anode and a dissimilar metal cathode, in an electrolyte comprising a benzene solution of a phenyl alkyl aluminum halide. No. 2,170,375. Frank C. Mathers, Bloomington, Ind., and Robert D. Blue, Midland, Mich.

A base alloy for electrical purposes, comprising a copper alloyed with 4% silver, 1% cadmium, and 0.3% boron. No. 2,170,431. Hans Heinrich Schwartzkopf, Reutte, Tyrol, Austria, to N. V. Molybdenum Co., Reutte, Tyrol, Austria.

Production a hard metal alloy, containing various refractory metal carbides, by a sintering method. Nos. 2,170,432-3. Paul Schwartzkopf, Reutte, Tyrol, Austria, to American Cutting Alloys, Inc., New York, N. Y., a corp. of Del.

Lead alloy for storage battery electrodes, containing 0.01-0.15% calcium and 0.005-0.05% barium. No. 2,170,650. George M. Bouton, Lynbrook, N. Y., and Earle E. Schumacher, Maplewood, N. J., to Bell Telephone Labs., Inc., N. Y. City.

Manufacture of copper powder, by reduction of a specially prepared and pulverized cuprous oxide. No. 2,170,814. Joseph E. Drapeau Jr., Calumet City, Ill., to The Glidden Co., Cleveland, Ohio, a corp. of O.

Method of melting light metal alloy scrap, with the aid of a flux consisting of a mixture of at least 3 different salts (sodium chloride, cryolite,

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and barium chloride), so proportioned as to melt between 520 and 690° C. No. 2,170,863. Erich Junker, Berlin-Charlottenburg and Willibald Leitgebel, Berlin-Wilmersdorf, Germany.

Method welding magnesium and its alloys, employing a flux comprising at least one inorganic halide non-volatile at the welding temperature, and a compound of the group consisting of phosphoric, oxalic, and boric acids and the acid salts thereof. No. 2,171,041. Josef Martin Michel. Bitterfeld, Germany, to Magnesium Development Corp., a corp. of Del.

Preparation an abrasive material of high crushing strength and impact resistance, comprising an iron alloy containing 3% carbon, 0.5% manganese, 1.5% silicon, 0.1% sulfur, 0.4% phosphorus, 0.25% to 3.0% chromium and 0.1-0.6% molybdenum. No. 2,171,081. John F. Ervin, Ann Arbor, Mich.

Preparation an abrasive material, of high crushing strength and impact resistance, comprising an iron alloy containing 3% carbon, 0.5% manganese, 1.5% silicon, 0.1% sulfur, 0.4% phosphorus, 0.1-1.5% chromium, 0.1-3.0% nickel and 0.1-0.6% molybdenum. No. 2,171.082. John F. Ervin, Ann Arbor, Mich.

Preparation an abrasive material having high crushing strength and impact resistance comprising an iron alloy containing 3% carbon, 0.5% manganese, 1.5% silicon, 0.1% sulfur, 0.4% phosphorus, 0.1-1.5% chromium, 0.1-3.0% nickel, and up to 0.06% vanadium. No. 2,171,083. John F. Ervin, Ann Arbor, Mich.

Method depositing gold film upon a surface, comprising contacting said surface with a solution of monohydric alcohol capable of direct oxidation, at least one compound of the group comprising alkali metal hydroxides and alcoholates, at least one organic gold compound of the empirical formula $R_2AuX$, where R is a univalent hydrocarbon radical and X a halogen. No. 2,171,086. Charles Stanley Gibson, Kingswood, Eng.

Manufacture a stable, finely divided silicon alloy containing over 35% silicon for use as a constituent of alkaline coating compositions, comprising forming a superficial coating of oxide on said alloy by heating in an oxidizing atmosphere at 300-1000° C. for a short time. No. 2,171,108. Ernest F. Doom, Niagara Falls, N. Y. to Electro Metallurgical Co., a corp. of West Va.

Manufacture an extrusable lead alloy, containing 0.02-0.25% tellurium and 0.03-0.1% copper, said alloy retaining a fine grain structure after extrusion at high temperatures. No. 2,171,180. Brinley Jones, Perivale, Eng., to Goodlass Wall and Lead Industries Ltd., London, Eng.

Manufacture a hard metal alloy, comprising mixing tungsten powder with an acid of the group consisting of vanadic and titanic acids, and adding a quantity of carbon less than that required to form the corresponding carbides, and then heating the powdered mass to 1500-2000° C., until a sintered tungstide is formed. No. 2,171,391. Alfred Boecker, Bielerhof, Biel, Switzerland, to Duradur S. A. Biel, Switzerland.

Method producing beryllium metal, comprising heating an intimate, solid mixture of beryllium chloride and magnesium to a suitable reaction temperature, and separating the beryllium from the magnesium chloride. No. 2,171,439. Helmut von Zeppelin, Bitterfeld, Ger., to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Ger.

## Paper & Pulp

Process of producing waterproof fibrous sheets. No. 2,168,778. John Alexander Montgomerie, Cambusland and Peter Kennedy Archibald, Ruthergien, Scotland, to American Bitumuls Co., San Francisco, Cal., a corp. of Del.

Method and apparatus for manufacturing wallboard. No. 2,168,803. John Page, Evanston, Ill., to United States Gypsum Co., Chicago, Ill., a corp. of Ill.

Manufacture a paper or fabric flexible product, having a non-brittle undercoat of tenacious filmforming oil mixture and a smooth, harder top coat of a drying oil-resinous mixture. No. 2,169,277. Francis Gurney Okie, to Minnesota Mining & Mfg. Co., both of St. Paul, Minn.

Coated paper, one side of which is coated with water-soluble, hygroscopic adhesive superposed on which is a slightly tacky layer of dextrin containing a small amount of starch. No. 2,170,654. Harold R. Dalton, Teaneck, N. J., to Postal Telegraph Cable Co., of New York, N. Y.

## Petroleum

Conversion of normally gaseous paraffins into the corresponding olefins, by passing the former at 400-770° C. over an alumina catalytic body containing 2-10% chromium sesquioxide. No. 2,167,650. Aristid V. Grosse, Chicago, Ill., to Universal Oil Products, Co., Chicago, Ill., a corp. of Del.

Process providing for the reconditioning of solid catalytic bodies used in the conversion of petroleum hydrocarbons. No. 2,167,655. Eugene J. Houdry, Rosemont and Richard S. Vose, Ridley Park, Pa., to Houdry Process Corp., Wilmington, Del., a corp. of Del.

Method regenerating a solid catalyst body contaminated with oxidizable reaction residues accumulated in the processing of petroleum hydrocarbons. No. 2,167,698. Richard S. Vose, Ridley Park, Pa., to Houdry Process Corp., Wilmington, Del., a corp. of Del.

Method increasing the viscosity of unsaturated fatty oils having iodine nos. greater than 150, comprising reduction of the iodine number by hydrogenation, followed by silent electric discharge treatment to induce polymerization. No. 2,167,726. Roger W. Richardson, Baton Rouge, La., to Standard Oil Development Co., a corp. of Del.

Organic phosphate ester-containing petroleum lubricant for protecting cadmium-silver alloy bearings. No. 2,167,867. Anthony Francis Benning, Penns Grove, N. J., to E.. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Manufacture a synthetic cement, containing a urea-formaldehyde resin, ethylene glycol, and a very small amount of orthophosphoric acid. No. 2,167,874. David E. Cordier, Toledo. Ohio, and Emil H. Balz, Pittsburgh, Pa., to Plaskon Co., Inc., a corp. of Del.

Method halogenating lower aliphatic olefins, such as ethylene, by direct contact in the vapor phase of the 2 compounds at elevated temperatures. No. 2,167,927. Herbert P. A. Groll and George Hearne, Berkley, and James Brugin and Donald S. La France, Oakland, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Method purifying imido-alkylols by extraction with a water-immiscible organic ketone or ether having at least 5 carbon atoms. No. 2,167,931. Sumner H. McAllister, Lafayette, and George F. Johnson, San Francisco, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Method dewaxing petroleum hydrocarbon mixtures, cyclopropylene being the active separator. No. 2,167,970. Ulric B. Bray, Palos Verdes Estates Calif., to Union Oil Co. of Calif., Los Angeles, Calif., a corp. of Calif.

Method for thermally cracking petroleum distillates. No. 2,168,074. Victor Stapleton, New York, N. Y., to The Texas Co., New York, N. Y., a corp. of Del.

Method removing acidic components from petroleum distillates, the active absorbent being an aliphatic amino-glycol. No. 2,168,078. David Louis Yabroff, Berkeley, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Process for dewaxing and separating the dewaxed portion of wax-bearing petroleum distillates. Nos. 2,168,141-3. August Henry Schutte, Westfield, N. J.

Method desulfurizing alkyl phenols containing organic sulfur compounds, comprising contacting with finely divided polyvalent metal powder, whereby a metallic sulfide is formed. No. 2,168,256. Martin de Simo, Piedmont, Calif., and Aloysius Paul Brady, Oakland, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Preparation a resinous gear lubricant, being the residue after distillation of naphthenic acid-bearing fractions heavier than gasoline. No. 2,168,258. Gerald M. Fisher, Los Angeles, Calif., to Socony-Vacuum Oil Co., Inc., New York, N. Y., a corp. of N. Y.

Production light oils, as byproducts in the thermal polymerization of unsaturated hydrocarbons. No. 2,168,261. Robert M. Isham, Okmulgee, Okla., ¾ to William B. Pine, Okmulgee, Okla.

Preparation a lubricant containing a sulfonic acid ester. No. 2,168,262. Edwin N. Klemgard and Vernon L. Ricketts, Martinez, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Batch process for the aluminum chloride-catalyzed thermal polymerization of hydrocarbon gases. No. 2,168,271. Johannes Nicolas Jacobus Perquin, Rotterdam, and Hendrikus Stokman, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif., a corp. of Del.

Method removing a definite wax composition from wax-containing petroleum crudes. No. 2,168,306. August Henry Schutte, Westfield, N. J.

Method for the purification of petroleum mahogany sulphonates. No. 2,168,315. Manuel Blumer, Butler, Pa., to L. Sonneborn Sons, Inc., a corp. of Del.

Distillation and fractionation process and apparatus therefore, stabilizing pressure distillate, comprising rectifying said distillate in the presence of added propane. No. 2,168,316. David G. Brandt, Westfield, N. J., to Power Patents Co., Hillside, N. J., a corp. of Me.

Method for revivification of spent catalytic adsorbents. No. 2,168,327. Henry C. Cowles, Jr., and Arthur B. Hersberger, to The Atlantic Refining Co., all of Philadelphia, Pa., a corp. of Pa.

Purification of waxes separated from petroleum fractions. No. 2,168,330. Seymour W. Ferris, Aldan, Pa., to The Atlantic Refining Co., Philadelphia, Pa., a corp. of Pa.

Recovery of solvents used in processing petroleum distillates. No. 2,168,570. Wheaton W. Kraft, to The Lummus Co., both of New York, a corp. of Del.

Method of separating wax-containing materials. No. 2,168,574. Dwight B. Mapes and Eddie M. Dons, to Mid-Continent Petroleum Corp., both of Tulsa. Okla., a corp. of Del.

Catalytic alkylation of aromatic hydrocarbons. No. 2,168,590. Hugh S. Taylor, Princeton, N. J., to the M. W. Kellogg Co., New York, a corp. of Del.

Method of treating hydrocarbon oils, to convert normally liquid hydrocarbons thermally to normally gaseous compounds. No. 2,168,610. Hermann C. Schutt, North Tarrytown, N. Y., to Gyro Process Co., Detroit, Mich., a corp. of Mich.

Process for treating mineral oils, comprising the addition to a lubricating composition a sulfonic acid ester and urea. No. 2,168,666. Michael R. Cannon, State College, Pa.

Lubricant compositions for cadmium-nickel and like bearing alloys, comprising petroleum oils containing small proportions of alkyl cyanates and isocyanates. No. 2,168,674. Clarence M. Loane and Bernard H. Shoemaker, Hammond, Ind., to Standard Oil Co., Chicago, Ill., a corp. of Ind.

Gasoline refining process, separating paraffinic and naphthenic hydrocarbons of wide boiling range. No. 2,168,691. Vanderveer Voorhees, Hammond, Ind., to The Standard Oil Co., Chicago, Ill., a corp. of Ind.

Manufacture of oxidized petroleum acid compounds. No. 2,168,699. Robert E. Burk, Cleveland, Ohio, to The Standard Oil Co., Cleveland, Ohio, a corp. of Ohio.

Method of inhibiting carbon formation in metal reaction vessels. No. 2,168,840. Herbert P. A. Groll, Berkeley, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Process for the removal of mercaptans from mercaptide solutions in petroleum oils. No. 2,168,851. David Louis Yabroff, Berkeley, and Ellis R. White, Albany, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Method of treating oils, by countercurrent extraction of the crude distillate with appropriate solvent mixtures. No. 2,168.875. Henry D. Noll, Beaumont, Tex., to Socony-Vacuum Oil Co., Inc. New York, N. Y., a corp. of N. Y.

Lubricant composition, containing a metallic halo-naphthenate. No. 2,169,155. Bert H. Lincoln, Ponca City, and Alfred Henriksen, deceased, late of Ponca City, Okla., by John W. Wolfe, administrator de bonis non, Ponca City, Okla., by mesne assignments to The Lubri-Zol Development Corp., Cleveland, O., a corp. of Del.

Lubricating oils for cadmium-silver and like bearing alloys, containing a small quantity of a chloralkyl phosphite. No. 2,169,185. Bernard H. Shoemaker and Clarence M. Loane, Hammond, Ind., to Standard Oil Co., Chicago, Ill., a corp. of Ind.

Diesel fuel, comprising a fuel oil and a small amount of organic compound being a thio-derivative of an alkyl or aryl nitrite or nitrate. No. 2,169,186. Bernard H. Shoemaker and Howard R. Batchelder, Hammond, Ind., to Standard Oil Co., Chicago, Ill., a corp. of Ind.

Method recovering an aryl nitro compound, used as an extractive solvent in the processing of petroleum hydrocarbons. No. 2,169,218. Eugene R. Brownscombe, Aldan, Pa., to The Atlantic Refining Co., Philadelphia. Pa., a corp. of Pa.

Method increasing the density of an oil-bearing porous stratum, comprising injecting into the formation a soluble metal alcoholate which, on hydrolysis with water, forms an insoluble hydroxide within the pores of the formation. No. 2,169,458. Franklin A. Bent. Albert G. Loomis and Howard C. Lawton, Berkeley, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

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Production of isobutane, through the conversion of butane gas, by passing the latter over an activated carbon mass impregnated with aluminum chloride. No. 2,169,494. Vladimir Ipatieff and Herman Pines, to Universal Oil Products Co., all of Chicago, Ill., a corp. of Del.

Method preparing alkyl fatty acid esters through the interaction of an olefine and an alkyl sulfate. No. 2,169,227. Harold S. Davis and Alfred W. Francis, Woodbury, N. J., to Socony-Vacuum Oil Co., Inc., a corp. of N. Y.

Preparation a lubricant from a residual petroleum oil, said lubricant having a flash point of at least 525° C. and a fire point not less than 600° C. No. 2,169,545. Richard S. Yose, Ridley Park, Pa., to Sun Oil Co., Phila., Pa.

Preparation a lubricant, containing the reaction product of an olefine and a phenol, which has been treated further with phosphorus pentasulfide. No. 2,169,634. Troy Lee Cantrell and James Otho Turner, Lansdowne, Pa., to Gulf Oil Corp., Pittsburgh, Pa., a corp. of Pa.

An extreme pressure lubricant containing a small quantity of a thiocyano-organic compound. No. 2,169,700. Clarence M. Loane, Whiting, and Bernard H. Shoemaker, Hammond, Ind., to Standard Oil Co., Chicago, Ill., a corp. of Ind.

Production of gasoline-type petroleum hydrocarbons. No. 2,169,809. Jacque C. Morrell, Chicago, Ill., to Universal Oil Products Co., Chicago, Ill., a corp. of Del.

Manufacture a highly viscous, stable lubricant from the mineral oil wax present in asphalt crudes; said wax being polymerized and sulfurized by a catalyst containing naphthenic acids and raw caoutchouc. No. 2,169,918. Armin Joseph Kraus, Jersey City, N. J., to The Richards Chemical Works, Inc., Jersey City, N. J., a corp. of N. J.

Method cracking hydrocarbons. No. 2,170,169. Claude W. Watson, Yonkers, N. Y., to The Texas Co., New York, N. Y., a corp. of Del.

Process removing gum-forming materials from petroleum hydrocarbon vapors, comprising an impingement method, wherein the vapors are contacted with a solid catalyst of fuller's earth. No. 2,170,180. Malcolm P. Youker, Bartlesville, Okla., to The Gray Processes Corp., Jersey City, N. J., a corp. of Del.

Method polymerizing hydrocarbon gases, by passing same successively over catalyst masses of progressively weaker catalytic action. No. 2,170,275. Edwin F. Nelson to Universal Oil Products Co., both of Chicago, Ill., a corp. of Del.

Manufacture of gasolines, by causing isobutane to condense with normal butylenes over aluminum chloride at 0° C. No. 2,170,306. Vladimir Ipatieff and Herman Pines to Universal Oil Products Co., both of Chicago, Ill., a corp. of Ill.

Method and apparatus for the thermal conversion of petroleum hydrocarbon gases. No. 2,170,333. Bernard L. Kramer, to Universal Oil Products Co., both of Chicago, Ill., a corp. of Del.

Process for treating cracked petroleum hydrocarbon oil distillate, comprising subjecting said distillate, while in heated vaporous condition, to the action of sulfuric acid containing a monocarboxy-organic acid of relatively low volatility at a pressure less than atmospheric. No. 2,170,336. Jacque C. Morrel, to Universal Oil Products Co., both of Chicago, Ill.

Process for converting normally gaseous hydrocarbons into gasolines. No. 2,170,367. Frederick E. Frey, Bartlesville, Okla., to Phillips Petroleum Co., a corp. of Del.

Manufacture of alkyl sulfates. No. 2,170,401. Egi V. Fasce and John J. Owen, Baton Rouge, La., to Standard Oil Development Co., a corp. of Del.

Apparatus for the catalytic dehydrogenation of a hydrocarbon. No. 2,170,437. Alexis Voorhies Jr., Baton Rouge, La., to Standard Oil Development Co., a corp. of Del.

Manufacture a viscous, slightly adhesive gear lubricant. No. 2,170,495. Gerald M. Fisher, Los Angeles, Calif., to Socony-Vacuum Oil Co., Inc., New York, N. Y., a corp. of N. Y.

Method for purifying crude naphthenic acids containing both phenols and oil. No. 2,170,506. Harold G. Reiber, Long Beach, Calif., to Union Oil Co., of California, Los Angeles, Calif., a corp. of Calif.

Dewaxing process for mineral hydrocarbon oils. No. 2,170,508. Albert Schaafsma and Johannes Moritz Versteeg, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif., a corp. of Del.

Processing of petroleum oil, comprising treatment with nascent oxygen, treating with sulfuric acid, and separating the resultant sludge. No. 2,170,620. Constantin Skrepinsky, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Method de-asphaltizing petroleum oil, comprising passing the impure oil over a bauxite catalytic and adsorptive mass. No. 2,170,628. Ferdinand W. Breth, Petrolia, Pa., to L. Sonneborn Sons, Inc., a corp. of Delaware.

Preparation a polymerized wax ester derived from animal spermaceti. No. 2,170,665. Robert P. Russel, Short Hills, N. J., to Standard Oil Development Co., a corp. of Del.

Manufacture of gas and fuel oil from asphaltic petroleum stocks. No. 2,170,795. John Joseph Downey, Los Angeles, and William Wallace Murray, Downey, Calif., to Sinclair Refining Co., New York, N. Y., a corp. of Me.

Method of treating with swollen bleaching earths petroleum crudes, to yield at an appropriate temperature useful hydrocarbon products. No. 2,170,976. Matthias Pier, Heidelberg, and Walter Simon, Rudolf Becker and Fritz Stoewener, Ludwigshafen-on-the-Rhine, Ger., to Standard I. G. Co., Linden, N. J., a corp. of Del.

Continuous process treating oils, comprising the passage of oil vapor with reductant gases over minette, an oolitic ore, in the presence of steam and at 300-450° C. Released sulfur is removed as hydrogen sulfide, and does not form iron sulfide with the massive catalyst. No. 2,171,009. Heliodor Rostin and Karl Schuster, Berlin, Ger.

Process for contact purification of hydrocarbon vapors; method comprises separation of gum-forming impurities with a fused body at 70% $NH_4Zn_2Cl_5$ containing 30% $ZnCl_2$, at a temperature above the fusion-point of the salt mixture but below 480° C., the gum-forming bodies being separated from the condensate after treatment as described. No. 2,171,033. Franklin E. Kimball, Los Angeles, Calif.

Process for polymerizing olefins. No. 2,171,207. Arthur Hallam Boulthee, Martinex, Calif., to Shell Development Co., San Francisco, Calif., a corp. of Del.

Improved process yielding hydrocarbon polymers of the motor fuel range, comprising passing light hydrocarbons, including iso-olefins, over 55-85% sulfuric acid at 60-130° C., and recovering therefrom the polymers contained in the discharged gases so treated. No. 2,171,250. Francis M. Archibald, Elizabeth, N. J., to Standard Alcohol Co.

Resolution of petroleum emulsions, of the water-in-oil type. No. 2,171,328. Charles M. Blair Jr., Webster Groves, Mo., to Petrolite Corp., Ltd., a corp. of Del.

Preparation a tri-alkyl lead salt of nitrophenols. No. 2,171,423. Mario S. Altamura, Woodbury, N. J., to Socony-Vacuum Oil Co., Inc., New York, N. Y.

Conversion of low-M. W. olefinic gases by heat and pressure polymerization, into liquid hydrocarbons of the gasoline boiling range. No. 2,171,522. Karl Finsterbusch, N. Y. City, to The Pure Oil Co., Chicago, Ill., a corp. of Ohio.

Production a lubricating oil having a high viscosity index and low true color from a mineral oil containing naphthenic and paraffinc constituents, the steps comprising extracting the mineral oil with an admixture of solvents selected from the group consisting of a 60-40% chloraniline and 40-60% cresylic acid; 85-40% chloraniline and 15-60% phenol; 60-40% chlorophenol and 40-60% cresylic acid, to form 2 liquid layers, and separating and removing the solvents from each of said layers. No. 2,171,646. Arthur B. Brown, Hammond, Ind., and Fred F. Diwoky, Chicago, Ill., to Standard Oil Co., Chicago, Ill., a corp. of Indiana.

Manufacture a cracked gasoline normally tending to gummy formations, containing a polyhydroxyphenanthrene as a stabilizer. No. 2,171,780. George W. Ayers, Jr., to Gasoline Antioxidant Co., both of Chicago, Ill.

Production an interpolymerization product of isobutylene and a secondary butylene, comprising contacting a butane-butylene fraction with strong, mineral, polybasic acid capable of absorbing and polymerizing said olefins. No. 2,171,928. William P. Gage, to General Motors Corp., both of Detroit, Mich.

Treatment of inorganic mineral slimes occurring in oil wells, comprising forming aqueous dispersion of sulfonated glyceride and introducing same into that portion of a well where said slime has accumulated. No. 2,172,083. Abraham M. Herbsman, Huntington Park, Calif., to Industrial Patents, Ltd., Los Angeles, Calif.

Production iso-butane from saturated petroleum naphthas boiling above 280° F., comprising forming a mixture of said naphthas and aluminum chloride, heating said mixture above 100° F., but below 400° F., and heating and adding hydrogen chloride as a catalyst, recovering from the reaction mixture a gaseous product substantially iso-butane. No. 2,172,146. Robert F. Ruthruff, Hammond, Ill., to Standard Oil Co., Chicago, Ill., a corp. of Indiana.

Manufacture olefins from solid paraffins, comprising vaporizing the latter without substantial cracking thereof, heating with superheated steam to 540-570° C. for 3-6 sec. at a pressure below 75 p.s.i., then quickly quenching said vapors, and recovering and fractionating the vapors. No. 2,172,228. Adrianus Johannes van Peski, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif., a corp. of Del.

Degumming of contaminated hydrocarbon distillates, comprising contacting said vapors with solid, adsorbent catalytic material to effect polymerization of said gum-forming agents to products of higher boiling point than the desired materials. No. 2,172,436. Horace B. Cooke, Alexandria, Va., and Malvin R. Mandelbaum, N. Y. City, to The Gray Processes Corp., Newark, N. J.

Process for vacuum steam distillation of heavy petroleum oil. No. 2,158,425. Edward G. Ragatz, to Union Oil Company of California, both of Los Angeles, Calif.

Manufacture oxidation products from high M. W. paraffins, by treating the tarry mixtures with an aromatic nitro solvent. No. 2,158,650. Christoph Beck and Franz Kremp, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Catalytic process for manufacture of normally solid paraffins from carbon monoxide and hydrogen gases. No. 2,159,140. Johannes Eckell and Gerhard Ritter, Berlin, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method polymerizing naphtha-soluble materials with a phenolic compound, in the presence of activated clay. No. 2,160,537. William H. Carmody, to The Neville Corp., both of Pittsburgh, Pa.

Process for stabilizing fatty oil polymers. No. 2,160,572. Egon Eichwald, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Process dewaxing mineral oils. No. 2,160,573. Bernard Sutro Greensfelder, San Francisco, and Monroe Edward Spaght, Long Beach, Calif., to Shell Development Co., San Francisco, Calif.

## Pigments

Preparation a substantially white titanium pigment having a blue-gray undertone. No. 2,166,082. Willis F. Washburn, Roy Dahlstrom, and Andrew T. McCord, Metuchen, N. J., to National Lead Company, New York, N. Y.

Manufacture of titaniferous pigments, comprising titanium dioxide recovered from titanium-bearing siliceous minerals containing alkaline earth metals. Nos. 2,167,626-8. Hugh V. Alessandroni, N. Y. City, to National Lead Co., N. Y. City, a corp. of N. J.

Method preparing and compacting a flocculent carbon black. No. 2,167,674. Harold H. Offutt, Winchester, Mass., to Godfrey L. Cabot, Inc., Boston, Mass., a corp. of Mass.

Process of coloring plastic masses of rubber, comprising admixing with rubber, prior to vulcanization, phthalocyanine colorants. No. 2,168,576. Georg Niemann and Leo Kollek, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York, N. Y., a corp. of Del.

Manufacture of artificially-colored sodium-silicate-covered mineral granules. No. 2,168,593. Marion H. Veazey, Rutherford, N .J., to The Patent and Licensing Corp., N. Y., a corp. of Mass.

Azo pigment production, comprising forming an insoluble calcium-azo color and mixing same intimately with a rosinate. No. 2,168,888. Alfred Siegel, Roselle, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Manufacture water printing inks, containing water-insoluble pigment, sulfonated oil emulsificant, an ethanolamine, and copal resin. No. 2,170,198. Hans Hadert, Berlin, Ger., to Miehle Printing Press & Mfg. Co., Chicago, Ill., a corp. of Ill.

Production a high-temperature-resistant glaze, consisting of zircon and phosphoric acid with a minor quantity of pulverized ferrosilicon. No. 3,170,387. John D. Morgan, S. Orange, N. J., to Power Patents Co., Hillside, N. J., a corp. of Me.

Process manufacturing a composite calcium carbonate-titanium dioxide pigment; method comprises essentially the treatment of a prepared titanium dioxide-calcium sulfate with aqueous inorganic carbonate, whose metal ion forms a soluble sulfate until the calcium sulfate of the prepared composite has been converted to calcium carbonate. No. 2,170,800. Louis E. Barton, Windsor, Conn., to National Lead Co., New York, N. Y., a corp. of N. J.

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Manufacture a superior, white titanium dioxide pigment. No. 2,170,940. Roy Dahlstrom, Metuchen, N. J., to National Lead Co., New York, N. Y., a corp. of N. J.

## Resins, Plastics, etc.

Preparation a polyamide condensate having valuable properties for the processing and tanning of animal hide and fiber. No. 2,165,484. Johann Huismann, Leverkusen-Wiesdorf, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method increasing the plasticity of an elastic butadiene polymer, comprising treatment with an organic hydrazine derivative. No. 2,165,525. Mortimer A. Youker, Wilmington, Del., to E. I. du Pont de Nemours & Company, Wilmington, Del.

Method of making a sheet material from a soluble caseinate. No. 2,167,570. Hermann Heckel, Chicago, Ill., to Marbon Corp., a corp. of Del.

Preparation resinous materials from the reaction products of ammonia with a dihalogenhydrin of glycerol. No. 2,167,661. Leon Lilienfeld, Vienna, Austria; Paul Abel, Vienna, Austria (Germany), or in case of his inability to act, Emerich Hunna, Vienna, Austria (Germany), executors, and Antonette Lilienfeld, Vienna, Austria (Germany), sole heir of Leon Lilienfeld, deceased.

Manufacture of aliphatic amines derived from glycerine, by action of aqua ammonia upon glycerin dihalohydrins, which amine-derivatives possess resinous plastic properties, and seem to be a polymer of propylene. No. 2,167,807. Leon Lilienfeld, Vienna, Austria; Paul Abel, Vienna, Austria (Germany), or in the case of his inability to act, Emerich Hunna, Vienna, Austria, (Germany), executors, and Antonette Lilienfeld, Vienna, Austria (Germany), sole heir of the deceased Leon Lilienfeld.

Production of phenol-aldehyde-lignin resins. No. 2,168,160. Carroll A. Hochwalt and Mark Plunguian, Dayton, O., to the Mead Corp., Chillicothe, O., a corp. of O.

Cast resin with integral sheen, and the method of preparation thereof. No. 2,168,331. Charles M. Fields, Arlington, and George A. Wilkens, Ridgefield, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Water-soluble urea-formaldehyde ethylene glycol condensation products and process of producing same. No. 2,168,477. Theodore S. Hodgins, Detroit, and Almon G. Hovey, Pleasant Ridge, Mich.

Acceleration of vinyl halide polymerizations. No. 2,168,808. Frank K. Schoenfeld, Silver Lake Village, Ohio, to B. F. Goodrich Co., New York, N. Y., a corp. of N. Y.

Process of making vinyl-acetal resins. No. 2,168,827. George O. Morrison and Aubrey F. Price, Shawinigan Falls, Quebec, Canada, to Shawinigan Chemicals, Ltd., Montreal, Quebec, Canada, a corp. of Canada.

Phenolic resin molding composition. No. 2,168,981. William E. Flood and George B. Howells, Metuchen, N. J., to Catalin Corp. of America, a corp. of Del.

Production polysulfone resins, through the interaction of sulfur dioxide and an olefin. No. 2,169,363. Carl Shipp Marvel and Donald Sherwood Frederick, Urbana, Ill., said Frederick to said Marvel.

No. 2,169,366. Frederick M. Meigs, Niagara Falls, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Manufacture a molded acrylic acid polymer, as a stiffened member for shoes. No. 2,169,558. Harry Robert Dittmar, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation a viscous resin by condensing formaldehyde and glycerol with a phenolic body. No. 2,169,991. Israel Rosenblum, Jackson Heights, N. Y.

Production an odorless fiber from a polymer of isobutylene having an average molecular weight of 100,000 to 250,000. No. 2,170,439. Peter J. Wiezevich, Elizabeth, N. J., by judicial change of name to Peter J. Gaylor, to Standard Oil Development Co., a corp. of Del.

Quick-curing resin-fibre composition, comprising a sheeted fibrous base coated with a prepared phenol-formaldehyde resin. No. 2,170,755. Norman D. Hanson, Bloomfield, N. J., to Bakelite Corp., New York, N. Y., a corp. of Del.

Preparation a softening agent for cellulosic film; said agent being a slightly water-soluble, high-boiling carboxylic acid ester. Nos. 2,170,828-9. Frederick M. Meigs, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Preparation of a colorless, very high boiling liquid, diphenyl-mono-orthochlorphenyl phosphite; b.p., 238-246° C., at 6 mm. pressure. No. 2,170,833. Clarence L. Moyle, to The Dow Chemical Co., all of Midland, Mich.

Preparation a resin, permanently fusible, containing a reactive phenolic group which has been treated with an ester of anacardic acid. No. 2,170,950. Emil E. Novotny, Oak Lane, Pa., to Durite Plastics, Inc., Philadelphia, Pa.

Manufacture plastic resin-bonded articles, comprising wetting granular abrasive material, mixing therewith dry, powdered condensation resin and drying the coated particles so produced, and finally compressing the granules into a solid, abrasive article. No. 2,171,635. Norman P. Robie, Niagara Falls, N. Y., and Walter D. Rossow, Tiffin, O., to The Carborundum Co., Niagara Falls, N. Y.

Preparation a granular polymer of a methacrylate ester, comprising copolymerizing an aqueous suspension of finely-divided polymeric methacrylate ester with at least 10 times the amount of monomeric ester, and then recovering, by mechanical means, the solid, suspended granular copolymerizate. No. 2,171,765. Otto Rohm and Ernst Trommsdorff, Darmstadt, Ger., to Rohm & Haas Co., Philadelphia, Pennsylvania.

Method distilling a member of the group consisting of monomeric vinyl, acrylic, and methacrylic esters, acrylic and methacrylic nitriles, and styrene, by feeding the monomeric material into the lower half of a column feeding a phenol of higher boiling-point than the monomeric material into said column near the top, and causing the material to be vaporized, and so exposing the ascending vapors to a downflowing stream of the phenol. No. 2,171,795. Carl T. Kautter, Darmstadt, Ger., to Rohm & Haas Co., Phila., Pa.

Production urea-formaldehyde resins, comprising heating a non-acidic mixture of n-butonal, 1 equivalent of urea, and at least 2 equivalents of aqueous formaldehyde, until the reaction has at least reached the methylol urea stage, adding to the solution about 0.06% of formic acid (based on a dry weight of the starting materials), refluxing for 30-60 minutes, and then distilling under such pressure that the mix boils below 80° C., and carefully fractioning off the water contained therein. No. 2,171,882. Oskar R. Ludwig, Phila., Pa., to The Resinous Prods. & Chem. Co., Phila., Pa.

Preparation a heat-reactive, oil-soluble resin, comprising the reaction product of a tri-alkyl phenol and a methylene-containing substance, said product being a resinous material substantially free of volatiles under vacuum at 110° C., and soluble in drying oils to yield a heat-hardenable composition. No. 2,171,914. William H. Butler, Palisades Park, N. J., to Bakelite Corp., N. Y. City.

Product prepared by condensing a natural resin with a phenol, said phenol being a methylenesulfonic acid or alkaline salt. No. 2,171,963. Ernst Koch and Christoph Thomsen, Frankfort-am-Main-Hochst, and Karl Dachlauer, Hofheim in Taunus, Ger., to I. G. Farbenindustrie, A. G., Frankfort-am-Main, Ger.

Manufacture oily-to-resinous condensates from formaldehyde or acetaldehyde with a carbamate, in the presence of an acid-reacting substance. No. 2,171,965. Adolf Weihe, Bad Soden in Taunus, Ger., to Deutsche Celluloid Fabrik, Eilenburg, Ger.

Manufacture synthetic, porous building materials, comprising hydraulic mineral binding agent and an aromatic sulfonate of an alkanol. No. 2,172,076. Hans Wolf, Hermann Leuchs, and Hans Saenger, Ludwigshafen-am-Rhine, Ger., to I. G. Farbenindustrie A. G., Frankfort-am-Main, Ger.

Manufacture alcohol-soluble resins, comprising resins prepared from esters of 2,2-dimethylol, n-butanol, and a member of the group consisting of colophony and the resin acids contained therein. No. 2,172,305. Werner Wolff and Karl Vierling, Ludwigshafen-am-Rhine, Ger., to I. G. Farbenindustrie A. G., Frankfort-am-Main, Ger.

Production a more highly polymerized polyamide obtained from a diamine and a dibasic acid. No. 2,172,374. Paul J. Flory, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture a synthetic resin from a phenol-aldehyde condensate which has been intimately combined with rubber and a polymerized vinyl compound; said resin being moldable as a thermosetting and thermoplastic compound. No. 2,172,385. George F. C. Houghton, Teaneck, N. J.

Composition comprising a material of the group consisting of resins, gums, cellulose esters, and cellulose ethers, and as a plasticizer for the aforementioned a compound of the group consisting of aryl ethers of glyceryl mono-and di-acetates, propionates, butyrates, laurates, lactates, benzoates, cresotinates, salicylates, naphthoates, and cyclohexanoates. No. 2,173,181. Jack D. Robinson, Snyder, N. Y., to National Aniline & Chem. Co., N. Y. City.

Production a soluble condensation product capable of undergoing further condensation on the application of heat and of forming uniform, homogeneous products when reacted with an excess of substantially neutral resins, drying oils, or mixtures thereof; method comprises reacting a phenol substituted in the para position by a hydrocarbon radical having 4-7 carbon atoms with a substantial excess of formaldehyde over the theoretical equi-molar requirement, the reaction being carried out in the presence of strong, alkaline catalyst. No. 2,173,346. Victor H. Turkington, Caldwell, N. J., and William H. Butler, Arlington, N. J., to Bakelite Corp., N. Y. City.

Manufacture a packing material, comprising an elongated, curved body, prepared by treating long fibers of heat-resistant material with graphite and a binder of vulcanized rubber-like material. No. 2,173,744. Frank E. Payne, Glencoe, Ill., to Crane Packing Co., Chicago, Ill.

Manufacture a stiffening member for toes of shoes and other articles, comprising applying to an article comprising an outer layer and the stiffening material, a softening solution containing a solvent for the stiffening material (a cellulose derivative), and an alkali having a softening effect on said plastice layer, shaping and drying the treated article. No. 2,173,821. Bjorn Andersen, Maplewood, N. J., to Celluloid Corp., a corp. of N. J.

Preparation a sheet material, comprising a base material impregnated with rapidly-precipitated (from solution applied to said base) cellulose derivative from its solution in a low-boiling solvent. No. 2,173,861. Roy S. Richie, Newark, N. J., to Celluloid Corp.

Manufacture porous, voluminous polymers from a member of the group consisting of acrylates and their homologues. No. 2,160,054. Walter Bauer and Hellmuth Lauth, Darmstadt, Germany, to Rohm & Haas Co., Philadelphia, Pa.

Heat-stabilizing compound for substantially saturated acyclic hydrocarbon polymers of high M. W., comprising 0.01-5.00% of a thiophenolic compound. No. 2,160,172. Raphael Rosen, Elizabeth, and Robert M. Thomas, Union, N. J., to Standard Oil Development Co., of Delaware.

Resinous material, made from the condensation of alkylene and polyalkylene sulfonamides with formaldehyde. No. 2,160,196. Herman A. Bruson and John W Eastes, to The Resinous Products & Chemical Co., all of Philadelphia, Pa.

Oil-resistant plastic composition, comprising milling cured alkyd resin on mixing rolls until a strong sheet is formed, milling plastic polymers of chloroprene until broken down, and then milling together the two materials which are finally heat-cured. No. 2,160,230. Moyer M. Safford, Schenectady, N. Y., to General Electric Co., of New York.

Method regenerating bauxite adsorbent materials. No. 2,160,874. Anton Kinsel, Petrolia, Pa., L. Sonneborn Sons, Inc., of Delaware.

Process separating wax from petrolatum. No. 2,160,930. James M. Whiteley, Roselle, and Hans G. Vesterdal, Elizabeth, N. J., to Standard Oil Development Co., of Delaware.

Process for polymerization vinylidene chloride, comprising the solution of from 50-15 parts chloride in an inert water-immiscible liquid (50-85 parts) to form a gel having a liquefaction temperature of about 143-145 deg. C.; said liquid to have boiling-point above about 145 deg. C.; gel is heated above liquefaction point and cast into a film, the inert solvent then being removed from said film. No. 2,160,937. John H. Reilly, to The Dow Chemical Co., both of Midland, Mich.

Catalyst mixture for the polymerization of a vinylidene halide, comprising tetraethyl lead, a peroxide, one of the group consisting of organic poly-halo hydroxy compounds, chloracetyl chloride, and poly-halo aryl ethers, and an electrically-deposited, spongy copper material that has been treated with one of the group consisting of hydrogen chloride, hydrogen sulfide, and oxygen. No. 2,160,939. Robert C. Reinhardt, to The Dow Chemical Co., both of Midland, Mich.

Co-polymers of vinylidene chloride with one of the group comprising unsaturated esters of the type including 2-methyl-allyl, 2-chloroallyl, crotonyl, and cinnamyl esters of dicarboxylic acids. No. 2,160,940. Other lower alkyl esters of acrylic acid and its homologs. No. 2,160,945. Ralph M. Wiley, to The Dow Chemical Co., both of Midland, Mich.

Plastic composition, being prepared by mixing with a polyethylene sulfide type plastic, a polymerized isobutylene compound having an average M. W. above 800. No. 2,160,995. Peter J. Wiezevich, Elizabeth, N. J., by judicial change of name to Peter J. Gaylor, to Standard Oil Development Co., of Delaware.

Plastic composition, having oxidation-stable, non-tacky properties, suitable for molding, comprising a vinyl polymer of the class comprising

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normally-hard vinyl chloride polymer and vinyl acetate intimately mixed with polymerized isobutylene having an average M. W. of above 800. No. 2,160,996. Peter J. Wiezevich, Elizabeth, N. J., by judicial change of name to Peter J. Gaylor, to Standard Oil Development Co., of Delaware.

## Rubber

Mfr. a chemically-resistant surface, containing a superficial layer of hard rubber, underneath which is a layer of rubber chemically combined with 12-29% sulfur; latter layer adhering to the wall by means of a suitable cement. No. 2,167,716. Henry Harvey Harkins, River Edge, N. J., to United States Rubber Co., New York, N. Y., a corp. of N. J.

Manufacture a thermal seal, comprising rubber hydrochloride alone. No. 2,168,015. William C. Calvert, Cuyahoga Falls, Ohio, to The Wingfoot Corp., Wilmington, Del., a corp. of Del.

Process altering rubber, comprising treating its solution in an inert solvent with anhydrous $H_2F_2$, the product being a thermoplastic material. No. 2,168,279. Benjamin S. Garvey, Akron, O., to the B. F. Goodrich Co., New York, N. Y., a corp. of N. Y.

Preservation of rubber by treatment with a diarylamide of an aliphatic acid. No. 2,169,618. Robert L. Sibley, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo., a corp. of Del.

o,o'-Dialkylidene-diaryl dithiocarbamic acid and its derivatives, as vulcanizing accelerators for rubber. No. 2,170,037. Waldo L. Semon, Silver Lake Village, O., to The B. F. Goodrich Co., New York, N. Y., a corp. of N. Y.

Preparation of mercaptothiazolines. No. 2,170,059. Roger A. Mathes, Akron, O., to The B. F. Goodrich Co., New York, N. Y., a corp. of N. Y.

Method vulcanizing rubber with a quinone-imine compound. No. 2,170,191. Harry L. Fisher, Leonia, N. J., to United States Rubber Co., New York, N. Y., a corp. of N. J.

Method vulcanizing rubber, comprising heating it with sulfur in the presence of a bis-dipiperidyl-dithiocarbamate. No. 2,170,453. Marion W. Harman, Nitro, W. Va., to Monsanto Chemical Co., St. Louis, Mo., a corp. of Del.

Preparation of water-insoluble salts of 2-mercaptobenzothiazole, the metal derivatives being of the heavy metal type; said salts being coated with oily or waxy hydrocarbons, such that they form dry, soft, lumpy material. No. 2,170,670. Ira Williams, Woodstown, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method producing shaped, composite rubber articles from natural rubber compounded with butadiene-synthetic rubber. No. 2,170,947. Bernard James Habgood and Leslie Budworth Morgan, Blackley, Manchester, Eng., to Imperial Chemical Industries, Ltd., a corp. of Great Britain.

Manufacture an odorless, pressure-sensitive adhesive sheet material, comprising a flexible sheeting coated with a suitable solvent solution of rubber, resin, and phthalic acid. No. 2,170,949. Willard L. Morgan, Hammond, Ind., to Sylvania Industrial Corp., Fredericksburg, Va., a corp. of Va.

Manufacture an electrical insulation having stable, electrical losses at elevated temperatures, comprising a plasticized polymerized vinyl halide and lead resinate. No. 2,171,334. Raymond M. Fuoss, Schenectady, N. Y., to General Electric Co., a corp. of N. Y.

Method for processing rubber, comprising treating its solution in an inert solvent with a solution of boron trifluoride in acetic acid, and boiling the mixture. No. 2,171,395. Ernest Harold Farmer, Hertfordshire, and Henry Potter Stevens and James Walker Rowe, London Bridge, Eng., to The British Rubber Producers' Research Assn., London, Eng.

Preparation a prepared rubber mix containing a vulcanizing assistant, the latter being a carbamyl dithio-carbamate. Nos. 2,171,420-1. Ira Williams, Woodstown, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process casting rubber artieles, comprising forming a mixture of a water dispersion of rubber and dead-burned gypsum in amount to produce a pourable mixture, thereafter agglomerating the dispersion further by adding an agglomerating agent, and then molding and vulcanizing. Ernst Alfred Hauser, Cambridge, Mass., to "Semperit" Osterreichisch-Amerikanische Gummiwerke A. G., Vienna, Austria.

Method for processing rubber, comprising subjecting a rubber mix containing an organic accelerator and a halogen (with atomic wt. over 35 in available form) to such conditions tending to cause a greater degree of scorching than in the absence of said halogen, and then subjecting the mix to a vulcanizing temperature. No. 2,171,901. Norman R. Wilson, Belleville, N. J., and Arthur J. Lang, Jersey City, N. J., to Rare Metal Prods. Co., Belleville, N. J.

Process manufacturing formed shapes from aqueous rubber dispersions, comprising including in the dispersion a potential coagulant and a stabilizing excess of a water-soluble amine, coating a form with the dispersion and thereafter exhausting the excess of amine from the coating, thereby causing the potential coagulant to become active, thereby coagulating the coating. No. 2,172,401. Stephen B. Neiley, Winchester, Mass., to Dewey and Almy Chem Co., Cambridge, Mass.

Process yielding viscous to plastic polymers of isobutylene of increased stability, comprising subjecting a very pure isobutylene to polymerization at below —40° C., in the presence of a catalytic amount (less than 1%) of a sulfur compound. No. 2,172,403. Michael Otto and Helmuth G. Schneider, both of Elizabeth, N. J.; said Otto assignor to I. G. Farbenindustrie A. G., Frankfort-am-Main, Ger., and said Schneider assignor to Standard Oil Development Co., Linden, N. J., a corp. of Del.

Preparation a compounded latex containing a vulcanizer and having the property of remaining relatively stable and substantially unvulcanized on storage for a prolonged period of time, characterized in containing in addition to at least about 0.5% by weight of a primary amine, the radical being one of the group consisting of hydrogen, alkyl, and an alkali metal salt of an N-aralkyl-substituted dithiocarbamic acid. No. 2,172,463. Everett V. Anderson, Naugatuck, Conn., to U. S. Rubber Co., N. Y. City.

Process yielding divinylacetylene substantially free of ethinylbutadiene, comprising contacting a mixture of the 2 aforementioned compounds with a solution in sulfuric acid of mercuric sulfate, thereby separating the latter, contaminating compound. No. 2,173,272. Albert Smith Carter, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Rubber preservative, comprising a secondary tetrahydro-furfuryl aryl amine. No. 2,173,711. Albert M. Clifford, Stow, O., to Wingfoot Corp., Wilmington, Del.

Method accelerating rubber vulcanization, comprising vulcanizing in the presence of a compound prepared by the interaction of equivalent quantities of mercaptobenzothiazole and the equimolar addition compound of formaldehyde and diphenylguanidine. No. 2,173,731. Winfield Scott, Akron, O., to Wingfoot Corp., Wilmington, Delaware.

Preparation a rubber vulcanizing assistant. No. 2,173,732. Lorin B. Sebrell, Silver Lake, O., and Albert M. Clifford, Stow, O., to Wingfoot Corp., Akron, O., a corp. of Del.

Moldable plastic composition, comprising polymerized chloroprene intimately mixed with polymerized isobutylene of average M. W. above 800. No. 2,160,997. Peter J. Wiezevich, Elizabeth, N. J., by judicial change of name to Peter J. Gaylor, to Standard Oil Development Co., of Delaware.

Production molded rubber shapes from liquid rubber dispersions. No. 2,161,281. Mitchell Carter, Trenton, N. J., to Rubber Products, Inc., Chicago, Ill.

Production rubber hydrochloride films. No. 2,161,454. William C. Calvert, Chicago, Ill., to Wingfoot Corporation, Wilmington, Del.

Concentration of latex by evaporation from a solution containing a dialkali metal salt of a phosphoric acid ester of a higher aliphatic primary alcohol. No. 2,161,455. Albert M. Clifford, Stow, Ohio, to Wingfoot Corporation, Wilmington, Del.

Method for concentration of latex, comprising mixing the latex with colloid dispersed in soap solution, and centrifuging the mixture, thereby separating the lighter cream layer. No. 2,161,731. Nicholaas Hendrik van Harpen, Medan, Sumatra, Netherlands East Indies, to Algemeene Vereeniging Van Rubberplanters Ter Oostkust Van Sumatra, Sumatra, Netherlands East Indies.

## Textiles

Method of spinning acetate silk filaments. No. 2,167,909. James Henry Rooney and Philip Richard Hawtin, Spondon near Derby, Eng., to Celanese Corp. of America, a corp. of Del.

Method and apparatus for the electric discharge spinning of artificial fibers. No. 2,168,027. Ernest K. Gladding, Buffalo, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Method of dressing textiles, comprising their impregnation with a quaternary alkyl chloride derivative of N-dialkyl acetamide. No. 2,168,253. Gerhard Balle and Georg Schulz, Frankfort-on-the-Main, Ger., to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Method of treating rayon fabric with a hydrophilic coating containing also a less amount of a hydrophobic colloid, such that the fibers have a capillary affinity for water, although the fabric is itself water-resistant. No. 2,168,286. Warner Eustis, Newton, and Alan W. Vint, Walpole, Mass., to The Kendall Co., Boston, Mass., a corp. of Mass.

Cellulosic composition and method of preparing same. No. 2,168,348. Emmette F. Izard, Kenmore, N. Y., to E. I. du Pont de Nemours Co., Wilmington, Del., a corp. of Del.

Process of waterproofing textile material and the material thus obtained. No. 2,168,534. Joseph Nuesslein and Georg von Finck, Frankfort-on-the-Main, and Hermann Stark, Bad Soden in Taunus, Germany, to I. G. Farbenindustrie, Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Textile material and a process of preparing it. No. 2,168,535. Josef Nuesslein and Georg von Finck, Frankfort-on-the-Main, and Hermann Stark, Bad Soden in Taunus, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Preparation of iron free copper solutions for textile use. No. 2,168,985. Sverre Gulbrandsen, Gloucester, N. J., to New Process Rayon, Inc., Gloucester, N. J., a corp. of Del.

A dull-finish coated fabric and process of making the same. No. 2,169,200. Frank G. Uhler, Newburgh, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Manufacture of cellulose xanthate derivatives and artificial materials therefrom. No. 2,169,207. Leon Lilienfeld, Vienna, Austria; Paul Abel, Vienna, Austria (Germany), or in case of his inability to act, Emerich Hunna, Vienna, Austria (Germany), executor and Antoinette Lilienfeld, Vienna, Austria (Germany) sole heir of Leon Lilienfeld, (deceased).

Manufacture of textile filaments from polyvinyl alcohol. No. 2,169,250. Emmette F. Izard, Kenmore, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Method of improving textile fabrics, comprising their impregnation with a coating of a hardenable urea-formaldehyde resin. No. 2,169,392. Donald H. Powers, Moorestown, N. J., and Onslow B. Hager, Philadelphia, Pa., to Rohm & Haas Co., Philadelphia, Pa.

Manufacture a floor covering, comprising a textile fabric having a portion thereof woven of yarn dyed with a strongly fluorescent dye. No. 2,169,657. Henry E. Millson, Philadelphia, Pa., to The Calco Chemical Co., Inc., Bound Brook, N. J., a corp. of Del.

Manufacture of casein fiber of improved strength and water resistance. No. 2,169,690. Stephen P. Gould and Earle O. Whittier, Washington, D. C., dedicated to the free use of the People in the territory of the United States.

Manufacture a warp yarn from a cellulose base, said yarn being treated to render it highly flexible and anti-static. No. 2,169,757. John R. Caldwell, Kingsport, Tenn., to Eastman Kodak Co., Rochester, N. Y., a corp. of N. J.

Bath for silk degumming and dyeing. No. 2,169,881. Hugh Harold Mosher, Nutley, N. J., to The Richards Chemical Works, Inc., Jersey City, N. J., a corp. of N. J.

Treatment of casein fiber with nitrous acid to render the fiber resistant to shrinkage. No. 2,169,955. Theodoor Koch, Oosterbeek, and Henricus Anthonius van der Kroon, Arnhem, Netherlands, to American Enka Corp., Enka, N. C., a firm.

Preparation of textile assistants and the like, comprising nitroxy and nitro-hydroxy derivatives of aryl and/or aralkyl, or alkyl, compounds. No. 2,169,976. Fritz Guenther and Karl Saftien, Ludwigshafen-am-Rhein, Germany, to I. G. Farbenindustrie A. G., Frankfort-am-Main, Ger.

Manufacture artificial fiber from a cellulosic solution, the precipitating medium being the acyl halid of a polybasic organic acid. No. 2,170,017. Walter Frey, Freiburg, Breisgau, and Heinz Schwalenstocket, Korbach, near Cassel, Germany, to E. I. du Pont de Nemours & Co., Wilmington, Del.,

Method manufacturing artificial fiber from cellulosic solutions. No. 2,170,024. Winfield W. Heckert, Arden, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del., a corp. of Del.

Method treating textiles with a cyclohexylamine derivative, under elevated pressure. No. 2,170,190. Henry Dreyfus, London, Eng.

Production a textile assistant, by reacting alkali sulfite with a sulfuric ester of one of the higher fatty alcohols. No. 2,170,380. Hermann Holsten, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Ger.

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# U. S. Chemical Patents

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Manufacture a laminated fabric, the bonding plastic being a cellulose acetopropionate. No. 2,170,416. Harry W. Klinger, Wilmington, Del., to Hercules Powder Co., Wilmington, Del.

Manufacture a viscose filament embodying a small quantity of high-boiling petroleum. No. 2,170,752. Walter Hamis Glover, Leamington, and George Samuel Heaven, Coventry, Eng., to American Viscose Corp., a corp. of Del.

Method acylating silk fibroin, comprising exposing the fibroin to a residue being among the reaction products obtained in the production of ketene. No. 2,171,241. Treat Baldwin Johnson, Bethany, Conn., to Textile Foundation, Washington, D. C., a corp. of D. C.

Manufacture an artificial silk from regenerated cellulose containing a catalytically hydrogenated liquid residue of complex composition; said synthetic alcohol. No. 2,171,324. Walther Zetzsche, Premnitz, and Johannes Giesen, and Emmerich von Pongratz, Leuna, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-am-Main, Germany.

Method finishing textile fabric, comprising immersion of the fabric in aqueous cornstarch (1-3%) containing 2½-7½% stearate soap, followed by immersion in 1-5% aqueous solution of rare earth acetates. No. 2,171,475. Hilton Ira Jones and Llewellyn Jones, Wilmette, Ill.

Preparation a laminated fabric, for use especially in articles subjected to repeated laundering, comprising a plurality of layers joined by thermoplastic adhesive softening at about 275° F., said adhesive consisting of cellulose nitrate or acetate plasticized with methyl phthalyl ethyl glycolate. No. 2,171,505. Gustave Klinkenstein, Maplewood, N. J., to Maas & Waldstein Co., Newark, N. J.

Preparation a laminated fabric, comprising a plurality of layers joined by a composition of cellulose acetate plasticized with ethyl phthalyl ethyl glycolate. No. 2,171,506. Gustave Klinkenstein, Maplewood, N. J., to Maas & Waldstein Co., Newark, N. J.

Method producing pattern fabrics, comprising treating with a swelling agent a fabric containing woven in a pattern both inactive formaldehyde cellulose fiber and active, natural fiber; said active fiber being sensitive to said swelling agent, and thereby rendering the pattern visible. No. 2,171,513. Georges Heberlein and Ernst Weiss, both of Wattwil, Bunt, Switzerland, to Heberlein Patent Corp., N. Y. City.

Method rendering textile fabrics water-repellent, comprising treating same with an unsymmetric fatty-acid carbonic-acid ester anhydride, the fatty acid radical being of at least 10 carbon atoms and the carbonic acid ester having at least 2 carbon atoms to volatilize the carbonic acid radical having the lower number of carbon atoms, and to increase the water-repellence of said fabric. No. 2,171,791. Walther Kaase and Ernst Waltmann, Krefeld, Ger., to Heberlein Patent Corp., N. Y. City.

Method processing yarn, comprising applying thereto a lubricating and softening composition containing, as active ingredient, a derivative of phosphorus comprising an organic ester derivative of a phosphorous or thiophosphorous acid. No. 2,172,241. Joseph B. Dickey and James G. McNally, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.

Method treating silk textiles of the type so woven as to be subject to laddering, comprising coating the individual threads with an aqueous dispersion of rubber in dilute form, and containing only sufficient rubber solids to adhere to the individual threads remaining open, precipitating rubber from such dilute solutions upon the surface of each thread to form a very thin and uniform sheath of rubber substantially covering the thread, and then vulcanizing the same. No. 2,172,251. Lloyd G. Copeman, Flint, Mich., to Copeman Labs. Co., Flint, Mich.

Method treating textiles, comprising applying to same an asymmetric fatty acid anhydride containing an acyl radical of at least 10 carbon atoms, and a considerably shorter acyl radical capable of being split off upon heating, heating to split off the shorter radical, thereby causing the residual anhydride material to react with the textile fabric. No. 2,172,475. Walther Kaase, and Ernst Waltmann, Krefeld, Ger., to Heberlein Patent Corp., N. Y. City.

Process after-treating dried, twisted artificial silk threads in package form, the outer convolutions of which have been unable to shrink to the same extent as the inner layers thereof, comprising moistening the outer surfaces only of the package, so that the outer layers of thread will acquire from 40% to 100% moisture, and thereafter redrying the same. No, 2,172,516. Adrian J. L. Moritz and Willem J. D. van Dobbenburgh, Enka, N. C., and Alfred E. Sunderland, and Gilbert I. Thurmond, Asheville, N. C., to American Enka Corp., Enka, N. C., a corp. of Del.

Manufacture a fire, water, and mildew proofing compound for cotton and similar fabrics. Compound consists of organic matter at least 60% chlorinated solid or semi-solid at normal room temperatures, having water proofing properties and being decomposable at the combustion temperatures of said fabrics, releasing gases containing chlorine, a volatile solvent for the chlorinated matter. Compound also contains substantial proportions of water-soluble salt which does not give off oxygen on heating, and a pigment protecting the chlorinated material from decomposition, and also a plasticizer, the several ingredients being uniformly combined. No. 2,172,698. Edwin C. Clayton and Lawrence L. Heffner, Baltimore, Md., to Wm. E. Hooper & Sons Co., Baltimore, Md.

Method printing textiles, comprising coloring by means of printing paste, wherein the color is fixed on the fabric by steaming; said paste containing a dyestuff and sodium lactate as a combined medium for thickening the paste to add to its mechanical consistency, and for preventing the printed design from drying out before it can be fixed by steaming. No. 2,172,834. Alan A. Claflin, Winchester, Mass.

Process rendering textile fabrics water-repellent, comprising impregnating the material with an isocyanic acid ester having the formula RCONCO, where R signifies an alkyl, aralkyl, or cycloalkyl radical containing at least 10 carbon atoms, or signifies a saturated or unsaturated radical of an alcohol of the sterol series, and heating the impregnated material to increase the water-repellence thereof. No. 2,173,029. Ernst Waltmann and Edgar Wolff, Krefeld, Ger., to Heberlein Patents Corp., N. Y. C.

Method desizing textiles, comparing contacting the material which carries a polymeric carbohydrate as the essential sizing agent, with an aqueous solution of a persulfate, while above ordinary room temperature. No. 2,173,040. Josef Muller, Weissenstein-am-Drau, Austria. Application received as Serial No. 127,569.

Process associating fibrous material with an aqueous dispersion containing 3-30% colloidal treating material, causing the material to entrain therein an amount of said aqueous solution ranging from 40% to 250% of the weight of said material, and which is less than that required for "wet saturation" of said material, such that the substance holds its entire treating bath, said bath being capable of depositing upon said material substantially all of its dispersed rubber particles and maintaining the bath within the material under normally non-coagulative conditions for the latex composition, until the desired amount of rubber has deposited on the fibrous material. No. 2,173,242. Howard A. Young, Westfield, N. J., to U. S. Rubber Co., N. Y. C.

Method impregnating textile fabric with colloidally dispersed rubber, comprising associating with the material a bath of an aqueous dispersion of colloidal treating material at a pH in approximately its isoelectric zone under normally non-coagulative conditions for the dispersion, said dispersion being stable in the absence of fibrous material, but capable of depositing substantially all of its dispersed particles of treating material on the fabric under normally non-coagulative conditions, for the dispersion, and maintaining the fabric associated with the bath under normally non-coagulating conditions for the dispersion until the desired amount of rubber has been sorbed on the surface No. 2,173,243. Howard A. Young. Westfield, N. J., to U. S. Rubber Co., N. Y. City.

Process impregnating textile fabrics with latex. No. 2,173,244. Howard A. Young, Westfield, N. J., to U. S. Rubber Co., N. Y. City, New York, a corp. of N. J.

Method bleaching textiles, comprising wetting the materials at a temperature not substantially in excess of 100° F., with a sufficient quantity of acid, aqueous hydrogen peroxide to render said materials moist, maintaining the temperature and keeping the fabrics moist for a period of at least 2 hours, and until the bleaching action is substantially complete, and then drying the material. No. 2,173,474. Martin Evoy, Abington. Pa.

Preparation a mixed cellulose ester containing acetyl and fatty acid groups of 3-4 carbon atoms, comprising soaking cellulose with acetic acid, adding fatty acid of 3-4 carbon atoms, cooling to below 60° F., but not to a solidification point, adding anhydride-free sulfuric acid dissolved in a fatty acid of 3-4 carbon atoms, and maintaining the mass at 40-60° F., for a short time and subsequently adding an impelling anhydride and esterifying the cellulose, the bath containing at least 20% of propionyl or butyryl based on total acyl content of the bath. No. 2,173,945. Carl J. Malm, Rochester, N. Y., to Eastman Kodak Co., Rochester, N. Y.,

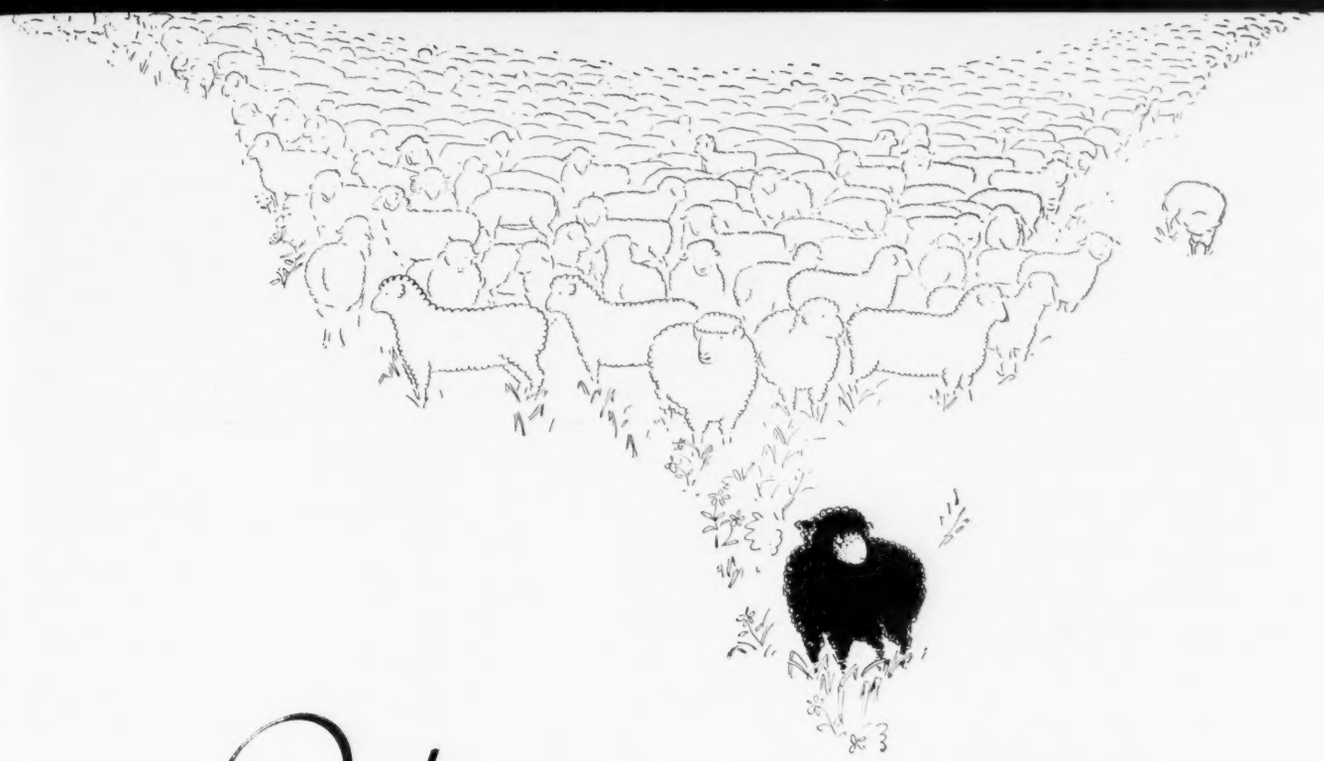
Method and apparatus for treating coloring fabrics. No. 2,174,227. Albert S. Jones, North Adams, Mass., to Arnold Print Works, North Adams, Mass.

Method producing artificial fibers, wherein the extruded filament passes through a neutral atmosphere for a short distance, and is then passed through spaced, high potential electrodes of opposite charge—the polarity alternating periodically—causing filament to form fine fibers, which are collected as slivers. No. 2,158,415-6. Anton Formhals, Mainz, Germany, forty-five-hundredths to Richard Schreiber-Gastell, Mainz, Germany.

## Water, Sewage, etc.

Chlorinator device, comprising means for metering and controlling the flow of chlorine gas into the water line, according to the variations in the water pressure. No. 2,168,616. William C. Blackmond, Ranger, Tex., 25%, to Joseph H. Reynolds, Sisco, Tex.

Preparation of zeolites, by sulfuric acid treatment of lignites, the washed and acid-free residue having greatly enhanced ion-exchange capacity. No. 2,170,065. Ray Riley, Long Island City, N. Y., to The Permutit Co., New York, N. Y., a corp. of Del.



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